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Tri-County Concentrating Mill (Former)
Site Inspection Report, Final
John Day, Grant County, Oregon

Prepared for:

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Region 10

START-3

Superfund Technical Assessment and Response Team

February 2013

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LIST OF ACRONYMS

Acronym	Definition
°F	degrees Fahrenheit
%R	percent recovery
µg/L	micrograms per liter
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cfs	cubic feet per second
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
DOGAMI	Oregon Department of Department of Geology and Mineral Industries
DQIs	data quality indicators
DQOs	data quality objectives
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
GW	groundwater
H	high bias
HRS	Hazard Ranking System
ID	identification
IDW	investigation derived waste
J	estimated result
K	unknown bias
L	low bias
LCS	Laboratory Control Sample
MCL	Maximum Contaminant Level
MDL	method detection limit
MEL	Manchester Environmental Laboratory
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate

Acronym	Definition
MSgt	Master sergeant
No.	number
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NWI	National Wetlands Inventory
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OSP	Oregon State Police
OWRD	Oregon Water Resources Department
PA	Preliminary Assessment
PPE	probable point of entry
Q	result above detection limit and below quantitation limit
QA	quality assurance
QC	quality control
R	rejected result
RPD	relative percent difference
RSL	Regional Screening Level
SAPS	Site Assessment Prioritization System
SARA	Superfund Amendments and Reauthorization Act
SD	sediment
SDG	sample delivery group
SI	Site Inspection
SOP	standard operating procedure
SPAF	Sample Plan Alteration Form
SQAP	Sampling and Quality Assurance Plan
SQL	sample quantitation limit
SS	surface soil
START-3	Superfund Technical Assessment and Response Team
TAL	Target Analyte List
TB	trip blank
TC	Tri-County Concentrating Mill (Former)
TDD	Technical Direction Document

Acronym	Definition
TDL	target distance limit
TechLaw	TechLaw, Inc.
TEL	Threshold Effects Limit
The site	Tri-County Concentrating Mill (Former)
Tri-County Concentrating Mill	Tri-County Concentrating Mill (Former)
U	non-detected result
UJ	non-detected result at estimated quantitation limit
U.S./US	United States
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds
WRCC	Western Regional Climate Center

1.0 INTRODUCTION

Pursuant to the United States (U.S./US) Environmental Protection Agency (EPA) Region 10 Superfund Technical Assessment and Response Team-3 (START-3) Contract No. EP-S7-06-03 and Technical Direction Document (TDD) No. 12-09-0007, TechLaw, Incorporated (TechLaw) conducted a site inspection (SI) at the Tri-County Concentrating Mill (Former) (the site, Tri-County Concentrating Mill) in John Day, Grant County, Oregon. The SI activities were conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The objectives of this SI are to:

- Document a threat or potential threat to public health and/or the environment posed by Tri-County Concentrating Mill;
- Assess the need for additional investigation and/or response action at Tri-County Concentrating Mill; and
- Provide the EPA with adequate information to determine whether the site is eligible for placement on the National Priorities List (NPL).

This document includes the site background information (Section 2), field sampling activities and analytical protocols (Section 3), quality assurance and quality control criteria (Section 4), analytical results (Section 5), potential sources (Section 6), migration pathways and targets (Section 7), summary and conclusions (Section 8), and references (Section 9).

2.0 SITE BACKGROUND

The following subsections discuss the site background, description, ownership history, and operations. Information presented in this subsection is based on a review of site background information using EPA Region 10 files.

2.1 Project Location

Site Name:	Tri-County Concentrating Mill (Former)
CERCLIS* No.	ORN001003031
Location:	John Day, Oregon
County:	Grant
Latitude:	44°24'57.58" North
Longitude:	118°56'34.16" West
Legal Description:	Highway 26, John Day, Oregon, NE ¼ of the NE ¼ of Section 26, Township 13 South, Range 31 East, Section 26
Site Owner(s):	Meadowbrook Apartments C/O Northwest Real Estate Capital Corporation Noel Gill 210 W. Mallard Boise, ID 83706 (208) 947-8593
Site Operator(s)/Contact(s):	Meadowbrook Apartments Property Manager 601 E. Main Street John Day, OR 97845 (541) 575-1363 ext. 221

* Comprehensive Environmental Response, Compensation, and Liability Information System

2.2 Site Description

The former Tri-County Concentrating Mill site is located north of Highway 26 (John Day Highway) approximately 0.25 miles east of the intersection of Highway 26 and NE 3rd Avenue in John Day, Grant County, Oregon (Figure A-1). The location is bordered on the north and northeast by the John Day River, on the south by Highway 26, and on the west by NE 3rd Avenue. The site is situated on relatively flat land at an approximate elevation of 3,121 feet above mean sea level with a steep 20 foot drop-off from the northernmost edge of the Meadowbrook Apartment Complex toward the John Day River (Appendix C) (TechLaw 2012a). The former Tri-County Concentrating Mill was located on current tax plots 102 through 105. (ODEQ 2011).

2.2.1 Site Ownership History

Between 1940 and 1947 a "boom-period" for chromite mining occurred in Grant County. Shortly after the Korean War began in 1950, the U.S. Federal Government began subsidizing

chromite mining. Based upon articles contained in The Ore.-Bin, an Oregon (formerly State) Department of Geology and Mineral Industries (DOGAMI) publication, the Tri-County Milling and Concentrating Corporation was organized in 1951 by Ernie Wells, W.A. Stinnett, and Joseph Curzon (DOGAMI 1952a). Building structures located on the former mill site can be seen on a 1953 historical aerial photo (Appendix C) (USGS 1953). The purpose of the buildings is unknown, but because of their location in relation to the former Tri-County Concentrating Mill, it is assumed they were part of the former facility which produced concrete blocks, and the former factory buildings may have been used to house some of the mill operations, as discussed in section 2.3.2. (TechLaw 2012b, DOGAMI 1952b).

2.2.2 Site Operations and Waste Characteristics

2.2.2.1 Historical Operations at Tri-County Concentrating Mill

The mill operated periodically throughout the 1950s and was purchased by Mr. Curzon in 1954 (Grant County 1954; ODEQ 2011). The mill ceased operations in 1958 when the government chromite subsidy program ended (The Oregonian 1958). Cobalt Gold Mines, Inc. leased the property from J.A. Curzon and Anna May Curzon in May 1959 (Grant County 1959; The Oregonian 1959a). The exact dates of operation of Cobalt Gold Mines, Inc. are not provided in available documentation. Over time, the property boundaries changed and the ownership history is unclear up to construction of current structures in the 1980s. Based on the 2011 Oregon Department of Environmental Quality (ODEQ) Site Assessment report, the current apartment complex structures appear on 1983 and 1984 aerial maps. The current site buildings include the two Meadowbrook apartment complexes and outbuildings, and the Oregon State Police (OSP) Outpost, which was constructed in 2011 (TechLaw 2012c).

During the SI, the Meadowbrook Apartment Maintenance Superintendent, who has resided in John Day since 1953, provided information regarding the historical layout of the site. The superintendent stated that prior to 1979 a mobile home sales company operated at the former Tri-County Concentrating Mill site. The superintendent estimated that the elevation of the site at that time was approximately 8 to 10 feet lower than the current topography. He stated that in 1979, approximately 10 to 15 feet of fill was added, which brought the site to its current elevation. The superintendent also described a City of John Day Public Works project in approximately 1995 or 1996 involving repair and maintenance to the sewer system, which occurred at the sewer standpipes along the City of John Day easement access road north of the Meadowbrook Apartment property. The bank was excavated and used as a borrow area during the repair (TechLaw 2012i). Because of the excavation, removal of top soil, and shaping of the bank during the repair to the sewer area, this area may be the most likely to contain exposed original native soil and potentially contaminated material from historical mill operations.

2.2.2.2 Waste Characteristics

Potential contaminants of concern at the former Tri-County Concentrating Mill area are metals associated with residual waste ore materials from milling operations, particularly Target Analyte List (TAL) metals such as chromium, cadmium, arsenic, and possibly mercury (The Oregonian 1959b). Waste handling procedures specific to Tri-County Concentrating Mill are not documented, therefore it is unknown if any man-made chemicals, such as solvents, fuels, or other possible contaminants of concern, were used during operations. No known releases have

occurred on the property but contamination from waste ore materials may remain (TechLaw 2012e).

2.3 Previous Investigations

The following subsections describe the site investigations that have occurred at the Tri-County Concentrating Mill site. Available file material did not indicate that environmental samples had been previously collected at the site.

2.3.1 February 2011 – ODEQ Site Screening Evaluation

ODEQ conducted a site screening evaluation in February 2011, and completed a Site Assessment Prioritization System Strategy (SAPS) recommendation. The SAPS score of "Further Action – High Priority" was assigned because there was insufficient information to add this site to the confirmed release list. The SAPS recommendation included available information on site practices during the 1950s era. Specifically, the SAPS document indicated that the site most likely operated without secondary containment. Chromium and possibly mercury were considered to be potential contaminants of concern. The site was given a high priority score and recommended for a Preliminary Assessment (PA) (ODEQ 2011).

2.3.2 February 2012 – Preliminary Assessment

A PA was conducted in February 2012 by START-3, under contract to EPA. Although no contamination was observed during the site visit, the investigation documented that mill operations did occur at this site based on local government records, historical photo collections displayed at the Grant County Museum, and through interviews of local residents.

Historical photographs depict a building and manufactured hillside on the northeast side of the property (Appendix C). In addition, interviews conducted with John Day residents, and a 1952 Memorandum Report from DOGAMI indicate that a factory plant, which manufactured concrete blocks, was located in the same vicinity as the buildings and manufactured hillside shown in historical photographs, and those buildings may have been used for milling operations (TechLaw 2012b, DOGAMI 1952b).

No information describing how the waste water, fines, and waste material produced by the crushing process and shaker tables were handled or disposed was found in available sources, with the exception of a one-sentence reference in a property deed to a "tailings pond property". The location of the tailings pond is unknown (TechLaw 2012g, Grant County 1959). .

3.0 FIELD ACTIVITIES AND ANALYTICAL PROTOCOLS

3.1 Sampling Methodology

A Sampling and Quality Assurance Plan (SQAP) was developed by START-3 and approved by EPA prior to field sampling (TechLaw 2012h). The SQAP was prepared from a review of background information and describes the sampling strategy, sampling methodology, and analytical program to investigate potential targets. The SI field activities were conducted in accordance with the approved SQAP. Deviations from the SQAP are documented in Sampling Plan Alteration Form (SPAF) presented in Appendix F.

The START-3 SI sampling event was conducted November 12 through 15, 2012. All surface soil, sediment, and groundwater samples were analyzed for TAL metals, including mercury and hexavalent chromium.

All analyses were performed by the Contract Laboratory Program (CLP) with the exception of hexavalent chromium in soil and sediment, which was performed at the EPA Region 10 Manchester Environmental Laboratory (MEL) and hexavalent chromium in groundwater, which was analyzed in the field using HACH Method 8023 as described in Appendix F of the SQAP.

Sample types and methods of collection are described below. A list of all samples collected for fixed laboratory analyses under the SI is presented in Table B-1. Photographic documentation of SI field activities is presented in Appendix C.

Alphanumeric identification (ID) numbers applied by START-3 to each sample location (e.g., TC-SD-02) are used in this SI report as the station location identifiers. Sample locations and descriptions are provided in Table B-1 and Figure A-3.

3.1.1 Surface Soil Samples

Eight surface soil samples, including one background sample and one field duplicate sample, were collected to assess potential soil contamination. The background surface soil sample was collected off site, on the south side of Highway 26 approximately one mile to the east. The sample was collected approximately five to six feet south of the roadway in soil from a hillside elevated three to four feet above the roadway. The soil appeared to be native to the area and is not anticipated to be impacted by the road due to the elevation above the roadway.

Samples were collected between zero to six inches below ground surface (bgs). Surface soil samples were collected in accordance with the sampling methodologies and the Standard Operating Procedures (SOPs) provided in the SQAP.

See Figure A-3 for on-site and background surface soil sample locations.

3.1.2 Sediment Samples

Six sediment samples, including one field duplicate and one background sample, were collected to assess potential sediment contamination. Four sediment samples and one duplicate sample were collected near the probable point of entry (PPE) north of the site along the south bank of the John Day River. The background sediment sample was collected approximately 0.25 miles east and upgradient of the site on the south bank of the John Day River.

Sediment samples were collected from zero to six inches in depth. Sediment samples were collected in accordance with the sampling methodologies and SOPs provided in the SQAP.

See Figure A-3 for the sediment sample locations.

3.1.3 Groundwater Samples

START-3 collected six groundwater samples, including one background sample and one field duplicate, to determine whether contamination has migrated from the site to the groundwater pathway. All groundwater samples were collected from city or residential wells located off site. Two groundwater samples and one duplicate sample were collected at city water supply wells located on the north side of the John Day River, City Well #3 located approximately 0.6 miles north of the site, and City Well #5 located approximately 0.7 miles north northwest of the site. One groundwater sample was collected from an auxiliary city water supply source at Long Gulch Springs, located approximately one mile south of the site off Burns Highway. One groundwater sample was collected downgradient and approximately 0.5 miles northwest of the site at the county fairgrounds. The background sample was collected approximately 1.5 miles south/southeast of the site (TechLaw 2012i).

The groundwater samples were collected directly from the spigots in accordance with the sampling methodologies and SOPs provided in the SQAP. Water quality parameters were measured and stabilized prior to sample collection.

Figure A-3 identifies each of the groundwater sampling locations.

3.2 Analytical Protocols

TAL metals analysis was performed through the CLP program in accordance with *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis ISM01.3* (EPA 2011). Hexavalent chromium in soil and sediment samples was analyzed by the EPA Region 10 Laboratory Environmental Services Assistance Team (ESAT) contractor by method 7196A (EPA 1992). Hexavalent chromium in groundwater samples was analyzed by the START-3 field team using a HACH test kit in accordance with Appendix F of the SQAP.

3.3 Global Positioning System

START-3 personnel used a Trimble GeoX Handheld Global Positioning System (GPS) Unit to record coordinates of all sample locations. GPS coordinates are provided in Appendix D.

3.4 Investigation-Derived Waste

Investigation-derived waste (IDW) generated during the SI sampling effort consisted of solid sampling equipment (e.g., gloves). Solid IDW was disposed of as non-hazardous waste through the city of John Day, Oregon solid waste program. No IDW generated during the SI sampling effort remains on site.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

A total of eight surface soil samples, six sediment samples, and six groundwater samples were collected. All samples were analyzed for TAL Metals and hexavalent chromium. TAL metals analysis was performed by A4 Scientific in accordance with *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis ISM01.3* (EPA 2011). Hexavalent chromium in soil and sediment samples was analyzed by the EPA Region 10 Laboratory ESAT contractor by method 7196A (EPA 1992). Hexavalent chromium in groundwater samples was analyzed by the START-3 field team using a HACH test kit in accordance with Appendix F of the SQAP. Specific quality assurance/quality control (QA/QC) requirements are presented in the SQAP (TechLaw 2012b).

All data from analyses performed were reviewed and validated by an EPA chemist or contractor not directly involved in data collection. Data qualifiers were applied, as necessary, according to the laboratory's current QA Manual, statements of work, SOPs, the SQAP, and the following guidance:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data Review (EPA 2010)

Copies of the data QA Data Validation Reports (DVRs) are included in Appendix G.

4.1 Satisfaction of Data Quality Objectives

The data quality objectives (DQOs) for the Tri-County Concentrating Mill Site were established using the *Guidance on Systematic Planning using the Data Quality Objectives Process* (EPA 2006). The EPA Task Monitor determined that definitive data with minimal error and bias would be the goal for the sampling and analyses conducted during the field activities. Upon completion of data validation, it was determined that all samples collected and analyzed by the laboratories achieved sufficient data quality to meet DQOs established in the SQAP (TechLaw 2012b). A detailed discussion of accomplished SI objectives is presented in the following sections.

4.2 Quality Assurance/Quality Control Samples

Samples were collected and processed in the field to assist in assessing the effectiveness of QA/QC protocols. Field QC samples included field duplicates and an equipment rinsate blank. Field duplicates were collected for one surface soil sample, one sediment sample, and one groundwater sample. One temperature blank sample per shipment cooler was submitted to the laboratory. A rinsate blank was collected using laboratory certified clean water and a decontaminated piece of sampling equipment (e.g., shovel) to confirm the sampling equipment was properly decontaminated in the field. Extra volume for matrix spike/matrix spike duplicates (MS/MSD) was collected for one surface soil sample, one sediment sample, and one groundwater sample.

4.3 Project-Specific Data Quality Indicators

The following describes the overall success of the field team and the laboratories at meeting DQOs based on the Data Quality Indicators (DQIs) of precision, accuracy, and completeness, and the overall success of the field team and the laboratories at meeting project DQIs for representativeness and comparability. The laboratories and field team were able to meet the project DQOs for all samples.

4.3.1 Precision

The reproducibility of the sampling protocols and analytical methodology is a measure of precision. Laboratory and field precision is expressed in terms of the relative percent difference (RPD) between duplicate sample analyses. The field and laboratory duplicate samples are used to assess the precision of the analytical method; in addition, field duplicates also assesses reproducibility for sample collection. Field duplicates were collected for one surface soil sample, one sediment sample, and one groundwater sample.

The RPD values were reviewed for all field and laboratory duplicates and MS/MSD. Six barium results (1.6% of the data) were qualified based on laboratory duplicate precision exceedances.

The DQO for precision was met.

4.3.2 Accuracy

Accuracy assesses the nearness of a result to the true (or accepted) value. Laboratory accuracy is assessed using the percent recovery (%R) of the MS/MSD.

The MS %R values were reviewed for all MS/MSD analyses. No results were qualified based on MS/MSD exceedances. It was noted during review of the hexavalent chromium results for soil and sediment that recoveries of the aqueous spike were below the control limits of 75-125%. Low recoveries of hexavalent chromium were attributed to reducing conditions of the samples, which are indicated by the non-detect results for all soil and sediment samples.

The DQO for accuracy was met.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All data were reviewed for data validation and usability.

Out of 371 data points provided by the laboratory, no results were rejected; therefore, 100% of the data is usable, meeting the completeness goal of 95% for the laboratory data.

The SQAP presented 22 samples to be collected, including two samples of opportunity. All proposed samples were collected including the samples of opportunity except for two sediment samples. The following alterations were made to the SQAP (see SPAFs in Appendix F):

- Two sediment samples were not collected as approved by the Task Monitor due to insufficient sediment available at the selected locations.

The DQO for completeness was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point or environmental conditions. The number and selection of samples were determined in the field to account accurately for Site variations and sample matrices. The DQO for representativeness was met.

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data presented in this report were produced following applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

4.4 Laboratory QA/QC Parameters

As appropriate for each analysis, the laboratory data also were reviewed for holding time violation; preservation and temperatures; initial calibration performance; contamination in any equipment/rinsate, trip, or laboratory blank samples; calibration verification check sample recoveries; laboratory duplicate sample RPDs; serial dilution analyses; interference check sample recoveries; internal standards recoveries; and secondary column confirmation. Findings from these QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.

4.4.1 Preservation/Holding Times/Temperatures

No results were qualified based on preservation, holding time, and temperature issues.

4.4.2 Initial and Continuing Calibration

No results were qualified on the basis of exceedances in the initial calibration or continuing calibration verification.

4.4.3 Laboratory Blanks

Laboratory blanks were prepared and analyzed in accordance with method requirements.

Metals were not detected in the associated laboratory blanks with the exception of:

- Mercury in sample delivery group (SDG) MJSJX9
- Mercury in SDG MJSJZ5

Metal results detected above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) were qualified as not detected (U) at the CRQL.

4.4.4 Rinsate Blanks

Rinsate blank sample analysis met the frequency criteria of one per event. One rinsate blank was collected for all analytes for this sampling event. No target analytes were detected in the rinsate blank above the quantitation limit, except for copper and manganese. All soil results were at

least ten times greater than the concentrations of these metals in the rinsate blank so no impact was observed.

4.4.5 Trip Blanks

No trip blanks were collected for this project because VOCs were not analyzed.

4.4.6 Laboratory Control Samples

Laboratory control samples (LCS) analyses were performed at a frequency of one per 20 samples, meeting QC frequency criteria. No sample results were qualified as estimated based on exceedance of LCS recovery criteria.

4.4.7 Serial Dilution

Serial dilution analyses were performed at a frequency of one per 20 samples per matrix, meeting QC frequency criteria. Thirty-six metal results (approximately 9.7% of the data) were qualified as estimated with possible low bias based on serial dilution exceedances.

4.4.8 Interference Check Samples

Interference check sample analyses were performed at a frequency of one per 20 samples per matrix for TAL metals, meeting QC frequency criteria. No sample results were qualified on the basis of interference check sample exceedances.

4.4.9 Internal Standards

Not assessed for inorganic analytes.

4.4.10 Second Column Confirmation

Not applicable for inorganic analytes.

4.4.11 Sensitivity

Thirty results (approximately 8.1% of the data) were qualified as estimated because the results were above the detection limit but below the CRQL.

5.0 ANALYTICAL RESULTS REPORTING AND BACKGROUND SAMPLES

This section describes analytical results reporting, sample locations, and analytical results of SI samples obtained from background locations. The sampling rationale, analytical results, and potential targets for the source areas and migration pathways are summarized in Sections 6.0 and 7.0 of this report. Analytical data for the surface soil, sediment, and groundwater samples are summarized and presented in Tables B-2 through B-4 in Appendix B. The complete set of laboratory analytical data sheets is located in Appendix G.

5.1 Analytical Results Evaluation Criteria

Analytical results presented in Tables B-2 through B-4 in Appendix B show all compounds detected above the sample quantitation limit (SQL) in bold type. Analytical results indicating significant concentrations of contaminants in source samples (discussed in Section 6.0) with respect to background concentrations are shown underlined and in bold type. Similarly, analytical results indicating elevated concentrations of contaminants in target samples (discussed in Section 7.0) with respect to background concentrations are also shown underlined and in bold type. For the purposes of this SI, significant/elevated concentrations are defined using Table 2-3 of the EPA Hazard Ranking System (HRS) model criteria for observed release as follows:

- Equal to or greater than the sample's CRQL, or the SQL when a non-CLP laboratory was used; and
- Equal to or greater than the background sample's CRQL or SQL when the background concentration is below detection limits; or
- At least three times greater than the background concentration when the background concentration equals or exceeds the detection limit.

The following qualifiers were used in data validation:

U: Indicates the compound or analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit corrected for dilutions and moisture content.

J: Indicates the compound or analyte was analyzed for and detected. However, the associated value is considered an estimate due to identified QC deficiencies. Data flagged with a "J" may be usable for decision-making purposes, depending on the DQOs of the project.

UJ: Indicates the compound or analyte was analyzed for and not detected. However, the associated detection limit is considered an estimate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.

H High bias

K: Unknown bias

L: Low bias

Q: Detected concentration is below the SQL/CRQL, but is above the method detection limit. CRQL values are provided in parentheses adjacent to the original concentration for background samples.

5.1.1 Analytical Sample Results Reporting

Following EPA Region 10 policy, evaluation of aluminum, calcium, iron, magnesium, potassium, and sodium (common earth crust elements) is beyond the scope of this report. For this reason, these elements are not discussed.

5.2 Background Samples

Background results for the soil, sediment, and groundwater samples are shown in the first (left-hand) column of the analytical results summary tables. SQLs were included for data qualified with JQ. The Q qualifier indicates the result was estimated because the concentration was below the SQL. The background sample locations are depicted in Figure A-3.

5.2.1 Background Surface Soil Sample

5.2.1.1 Background Surface Soil Sample Location

The background surface soil (SS) sample, TC-SS-01, was collected south of Highway 26, approximately one mile east of Tri-County Concentrating Mill (TechLaw 2012i). The background surface soil sample location is depicted in Figure A-3.

5.2.1.2 Background Surface Soil Sample Results

Ten TAL metal constituents, arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc, were detected at concentrations above the SQL in the background surface soil sample. Although the concentration of arsenic exceeds the EPA Regional Screening Levels (RSLs) for residential and industrial soil, it does not exceed the naturally occurring regional average for Oregon of 3.77 milligrams per kilogram (mg/kg) (EPA 2011; DEMT 2007). Hexavalent chromium was not detected in the background surface soil sample. A summary of the background surface soil sample results is presented in Table B-2.

The complete set of sample results is presented in the analytical data package located in Appendix G.

5.2.2 Background Sediment Sample

5.2.2.1 Background Sediment Sample Location

Background sediment (SD) sample TC-SD-01 was collected from the south bank of the John Day River, approximately 0.25 miles east and upgradient of Tri-County Concentrating Mill (TechLaw 2012i).

The background sediment sample location is depicted in Figure A-3.

5.2.2.2 Background Sediment Sample Results

Nine TAL metal constituents, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc, were detected above the SQL in the background sediment sample. The concentrations of chromium and nickel exceed the National Oceanic and Atmospheric Administration (NOAA) Threshold Effects Levels (TELs), 37.3 mg/kg and 18 mg/kg, respectively (NOAA 2008). Hexavalent chromium was not detected in the background sediment sample. A summary of the background sediment sample results is presented in Table B-3.

The complete set of sample results is presented in the analytical data package located in Appendix G.

5.2.3 Background Groundwater Sample

5.2.3.1 Background Groundwater Sample Location

Background groundwater (GW) sample TC-GW-01 was collected from a residential drinking water well approximately 1.5 miles south/southeast of Tri-County Concentrating Mill (TechLaw 2012i). According to the Oregon Water Resources Department (OWRD) well database, the well depth for the wells at the background location range from 278 feet to 370 feet (OWRD 2012a).

The background groundwater sample locations are depicted on Figure A-3.

5.2.3.2 Background Groundwater Sample Results

Five TAL metal constituents, arsenic, barium, chromium, vanadium, and zinc were detected in the background groundwater sample at concentrations exceeding the quantitation limits. None of the concentrations detected in the background groundwater sample exceed the EPA Maximum Contaminant Levels (MCLs); however, the arsenic concentration detected (3.9 milligrams per liter [µg/L]) exceeds the RSL of 0.045 µg/L (EPA 2009; EPA 2011). Hexavalent chromium was not detected in the background groundwater sample. A summary of the background groundwater sample results is presented in Table B-4.

The complete set of sample results is presented in the analytical data package located in Appendix G.

6.0 POTENTIAL SOURCES

This section describes the sample locations and analytical results of the SI samples obtained from potential sources. The sampling locations, sampling rationale, and analytical results are summarized in the following sections. Sample results are summarized in Tables B-2 through B-4.

The former site is currently covered by pavement/concrete or buildings. In addition, based on information provided by the Meadowbrook Apartment Maintenance Superintendent, 10 to 15 feet of fill was placed on the site in 1979 ultimately concealing the original grade and potentially contaminated soil attributable to the former mill (TechLaw 2012i). Therefore, START-3 was unable to collect source samples from the potentially contaminated soil on-site. Seven surface soil samples, including one duplicate, were collected offsite from along the northern property line. Based on the topography (i.e., the steep bank and John Day River), any potential offsite migration is assumed to be to the north. For purposes of this SI, the seven surface soil samples collected from the vicinity of the northern property line will be used as source samples.

6.1 Surface Soil Samples

6.1.1 Surface Soil Sample Locations

As described in Section 3.1.1, eight surface soil samples were collected, including one duplicate and one background, to characterize the source area and to determine the potential for migration of hazardous substances (TechLaw 2012h). Seven soil samples were collected from six locations within 200 feet of the Tri-County Concentrating Mill, which is currently occupied by the Meadowbrook Apartment Complex.

Soil sample TC-SS-02 was collected approximately 107 feet north of the northeast corner of Meadowbrook Apartment Complex #2. Sample TC-SS-03 and duplicate sample TC-SS-08 were collected approximately 139 feet north of the northwest corner of Meadowbrook Apartment Complex #2. Sample TC-SS-04 was collected approximately 40 feet northwest of Meadowbrook Apartment Complex #1 Manager's Office deck. Sample TC-SS-05 was collected approximately 181 feet north northeast of Meadowbrook Apartment Complex #1 on the south edge of the City of John Day easement access road. Sample TC-SS-06 was collected approximately 153 feet north of Meadowbrook Apartment Complex #1 on the south edge of the City of John Day easement access road, and sample TC-SS-07 was collected approximately 20 feet north of Meadowbrook Apartment Complex #1 Manager's Office deck.

Sample locations are illustrated in Figure A-3

6.1.2 Surface Soil Sample Results

Two surface soil sample locations, one north of Meadowbrook Apartment Complex #2 (TC-SS-02) and one north midway between Meadowbrook Apartment Complex #1 and Meadowbrook Apartment Complex #2 (TC-SS-03 and duplicate sample TC-SS-08), contained elevated concentrations of TAL metals. Both locations are within 200 feet of an apartment complex building. Cadmium and mercury were detected at elevated concentrations in all three surface soil samples collected from these locations. In addition, zinc was detected at elevated concentrations in surface soil samples TC-SS-02 and TC-SS-03, but not in the duplicate sample.

Hexavalent chromium was not detected in any of the surface soil samples collected. No additional elevated concentrations were detected in surface soil samples collected.

None of the elevated concentrations of cadmium, mercury, or zinc exceed the residential or industrial RSLs for soil (EPA 2011). Arsenic concentrations ranging from 2.7 mg/kg to 6.2 mg/kg in all seven surface soil samples collected were not elevated when compared to the background concentration, but exceed the residential (0.39 mg/kg) and industrial (1.6 mg/kg) RSLs (EPA 2011). Five of the concentrations were slightly above the 3.77 mg/kg state average for naturally occurring arsenic (DEMT 2007). In addition, three of the concentrations detected in surface soil samples exceeded the residential RSL for cobalt (23 mg/kg); however, the concentrations were not elevated when compared background (EPA 2011). Naturally occurring concentrations of cobalt in Oregon could not be located.

Analytical results for the surface soil samples are summarized in Table B-2.

7.0 MIGRATION PATHWAY AND TARGETS

The following section describes the migration pathways and potential targets within the range of influence of Tri-County Concentrating Mill. Analytical results are summarized in Tables B-2 through B-4. Analytical data QA forms from laboratory analysis are provided in Appendix G. This section discusses the groundwater migration pathway (subsection 7.1), surface water migration pathway (subsection 7.2), soil exposure pathway (subsection 7.3), and the air migration pathway (subsection 7.4).

7.1 Groundwater Migration Pathway

This subsection presents the pathway description, targets, sample locations, and sample results for the groundwater migration pathway. The target distance limit (TDL) for the groundwater migration pathway is a 4-mile radius that extends from the sources at the facility.

Figure A-4 depicts the groundwater 4-mile TDL.

7.1.1 Geology and Hydrogeology Descriptions

7.1.1.1 Regional Geology

John Day lies within the Blue Mountains physiographic province, in what is referred to as "John Day Country." John Day Country covers an area of roughly 4,000 to 5,000 square miles in the southwestern part of the Blue Mountain region of Oregon, and is in the borderland between two major geologic provinces. The first, located to the north, is the Columbia Plateau, which consists of flat or gently tilted basalt flows that cover approximately 100,000 square miles. The second, located to the south, is the Basin and Range Province, which extends into Mexico, and is characterized by a wide variety of complex folds and faults. The Strawberry-Aldrich Mountain Range, ranging from 7,000 to 9,000 feet in altitude, runs along the south side of the John Day River Valley and is part of a 150-mile long, east-trending mountain chain that locally separates the two provinces (USGS 2005).

The oldest known geologic units in the John Day Country are comprised of lava flows and the deposition of volcanic ash, sandstone, shale, and small lenses of limestone in marine environments that occurred in the late Paleozoic Era, more than 250 million years ago. Between 200 and 250 million years ago igneous intrusions of magma into these marine deposits formed peridotite and gabbro units. Much of northeastern Oregon was formed by exotic terranes of Permian, Triassic, and Jurassic rock that were accreted to what was then the western coast of the North American continent, near the Idaho border between 165 and 130 million years ago. This accretionary process was driven by subduction beneath the North American Plate. Deposition and erosional processes formed various sandstones, shales, and conglomerates between 130 and 50 million years ago and magmatic material intruded to form the granitic rocks of the Aldrich Mountains and Dixie Butte, northeast of Prairie City. By the beginning of the Cenozoic era, approximately 65 million years ago, the Blue Mountains province was uplifted, and the Pacific Ocean shoreline shifted to the west (USGS 2005).

Volcanic activity associated with continued subduction built a broad volcanic arc across much of the eastern portion of Oregon about 44 million years ago, during the Eocene. Eruptions deposited lavas accompanied by debris flows (lahars) atop the older rocks in the western part of

the province. These debris flows contained fragments of shale, siltstone, conglomerates, and breccias, as well as plants and animals, which, along with interlayered river and lake sediments, formed the fossil-rich Clarno Formation. Eroded remnants of the Clarno stratovolcanoes, which were once the size of Mount Hood, are visible in the form of buttes, such as Black Butte and White Butte. The Clarno Formation was extensively folded and faulted and deeply eroded prior to the deposition of the next unit, the John Day Formation (USGS 2005).

After the Clarno volcanism had subsided, a second period of volcanism started about 36 million years ago from volcanoes to the west, in the general vicinity of what would become the Cascade Range. These volcanoes emitted large volumes of ash and dust, much of which settled in the John Day basin. Similar to earlier Clarno debris flows, the rapid deposition of ash preserved the remains of plants and animals living in the region. Volcanic activity continued into the early Miocene (about 20 million years ago). Due to the varied climatic and volcanic conditions, as well as the accumulation of debris from multiple eruptions, the layers within the John Day Formation vary in chemical composition and color. The lowermost layer contains red ash, the middle layer is mainly a pea-green clay, and the top layer is lighter in color (USGS 2005).

After another period of erosion, a series of basalt flows erupting from fissures across northeastern Oregon, southeastern Washington, and western Idaho inundated much of the Blue Mountain province and formed the Columbia River Basalt Croup. More than 40 separate flows make up the Columbia River Basalt Group, and this flow occurred in the middle Miocene between 17 and 12 million years ago. The most prominent of these formations is the Picture Gorge Basalt, which rests above the John Day Unit (USGS 2005).

Subsequent ashfall from eruptions in the Cascade Range in the late Miocene formed the Mascall Formation, which is composed of layers of stream-deposited volcanic tuffs laid atop the Picture Gorge Basalt. Strong compressive forces in the north-south direction formed the Strawberry-Aldrich Mountain range, as well as the ridges and valleys north of this range. The floor of the main John Day River valley was filled with sands and gravels eroded from the Strawberry-Aldrich Mountain range, and an extensive, broad, gently sloping surface was formed on top of the valley fill. These gravels make up the majority of the Rattlesnake Formation and lies upon the Mascall Formation. The last major eruption occurred in the late Miocene, about 7 million years ago, and formed the Rattlesnake Tuff, which is an ignimbrite that caps the Rattlesnake Formation. Quaternary alluvium covers many of the low lying areas, and is composed of unconsolidated silt, sand, and gravel (USGS 2005).

The area along the John Day River is covered with fluvial deposits comprised of loamy silts. The soil is dark brown in color and contains organic materials, such a sticks, roots, and leaves. The apartment complex area is either paved or covered with non-native sands and gravels (TechLaw 2012i).

7.1.1.2 Hydrogeology

Groundwater in the John Day Basin originates as precipitation falling on the uplands and lowlands. A great deal of Grant County's precipitation comes in the form of winter snow in the mountains, and this snow pack is vital to recharge aquifers. The direction of groundwater flow under the site is to the north, toward the John Day River (USGS 2005).

7.1.2 Targets

Approximately 364 domestic wells are located within the 4-mile TDL, serving approximately 797 people (OWRD 2012b). The populations served for domestic wells were calculated using US Census Bureau average people per household in Grant County of 2.19 people (US Census 2012). Each well is assumed to serve one household. Based on information provided by the City of John Day Public Works, 95 percent of the drinking water supplied for the population of John Day is provided by four deep-water community wells, which includes two primary wells and two back-up wells. Based on the information obtained from the City of John Day, domestic wells are not typically used for drinking water by residents (TechLaw 2012d).

The closest community well to the site is located within 0.25 miles of the site. The two City of John Day primary wells are located within the 0.25 to 0.5 mile radius of the site (OWRD 2012b). Based on information provided by the City of John Day, Long Gulch Spring, located in the southeast section of John Day, serves as an additional resource for drinking water. The spring along with the two primary wells serve a total of 1,920 people. The nearby town of Canyon City has a separate community water system consisting of two springs and one well, which serves 676 people. Canyon City is located within the one to two mile radius of the site (Google Earth 2013).

A search of the State of Oregon's well database shows that groundwater within the 4-mile TDL is also used for irrigation and industrial purposes.

Table B-5 provides a summary of the groundwater wells located within the 4-mile TDL and populations served.

7.1.3 Groundwater Samples

7.1.3.1 Groundwater Sample Locations

Six groundwater samples, including one duplicate, were collected from drinking water wells as part of the SI activities at Tri-County Concentrating Mill. The groundwater samples were collected from five off-site drinking water wells, including one background (TechLaw 2012i). There are no known drinking water wells located on the site.

Three groundwater samples, including a duplicate sample, were collected at two city water supply wells located on the north side of the John Day River, City Well #3 located approximately 0.6 miles north of the site, and City Well #5 located approximately 0.7 miles north northwest of the site. One groundwater sample was collected from an auxiliary city water supply source at Long Gulch Springs, located approximately one mile south of the site off Burns Highway. One groundwater sample was collected downgradient and approximately 0.5 miles northwest of the site at the county fairgrounds. The background sample was collected approximately 1.5 miles south/southeast of the site. (TechLaw 2012i).

Well depths of the drinking water wells sampled were determined from the OWRD well database. The fairgrounds well is 50 feet in depth, City Well #5 is 199 feet in depth, City Well #3 is 250 feet in depth, and Long gulch springs is 370 feet in depth (OWRD 2012a). The known well depths are presented in Table B-4.

7.1.3.2 Groundwater Sample Results

Three TAL metal constituents, copper, lead, and manganese, were detected at elevated concentrations in groundwater samples collected within the pathway. Copper, lead, and manganese were detected at elevated concentrations in City Well #3, located approximately 0.6 miles north of the site. Manganese was also detected at elevated concentrations in City Well #5, located approximately 0.7 miles north northwest of the site, and the fairgrounds well, approximately 0.5 miles northwest of the site. No additional inorganic constituents were detected at elevated concentrations. Hexavalent chromium was not detected in any of the groundwater pathway samples collected.

The elevated copper and lead concentrations detected in City Well #3 do not exceed the MCLs. The concentrations of manganese detected in the groundwater samples (one field and one duplicate sample) collected from City Well #5 exceed the National Secondary Drinking Water Regulations standard of 50 µg/L, but do not exceed the RSL of 320 µg/L(EPA 2009; EPA 2011). Arsenic concentrations ranging from 0.94 µg/L to 1.8 µg/L in all five groundwater pathway samples collected were not elevated when compared to the background concentration, but exceed the 0.045 µg/L RSL (EPA 2011). None of the other inorganic constituents detected (and not elevated) in the groundwater samples collected exceed the drinking water standards.

Groundwater analytical results are summarized in Table B-4.

7.2 Surface Water Migration Pathway

This subsection presents the pathway description, targets, sample locations, and sample results for the surface water migration pathway.

7.2.1 Pathway Description

The surface water migration pathway begins at the PPE of source water runoff from the Site to the nearest perennial surface water body and extends downstream 15 miles. The John Day River is located approximately 200 to 400 feet to the north of the former Tri-County Concentrating Mill site.

Grant County is located in Climate Division 7 in south central Oregon, which consists primarily of high desert prairie. Average precipitation in the John Day, Grant County area is 13.1 inches per year (WorldClimate 2010). Average high temperatures in Grant County range from 80 to 90 degrees Fahrenheit (°F) during the summer months to 30 to 40°F in the winter. Grant County has an estimated 300 days of clear, sunny, or partly sunny days each year. The county experiences an estimated 65 days of overcast skies (Grant County 2013). The 2-year, 24-hour rainfall event for the area is 0.95 inches (NOAA 1973a, NOAA 1973b). The former Tri-County Concentrating Mill property lies outside the 100-year floodplain (FEMA 2012).

The PPE is established where potential migration of contaminants from the source area contacts the surface water bodies in the vicinity. Excess surface water accumulating on non-paved surfaces would likely flow down the northern bank and into the John Day River, possibly from multiple locations along the bank (exact drainage patterns are unknown). Therefore, multiple PPEs are possible. Because the exact location of the former mill operations is unknown and the

exact drainage patterns are unknown, the northern bank is being considered the PPE for the site. The PPEs have an overland distance of approximately 400 feet running north of the former mill. The PPEs enter the John Day River and flow in a westerly direction. The 15-mile TDL is completed downstream in the John Day River. The 15-mile TDL is presented in Figure A-5.

The director of the City of John Day Public Works Department stated that stormwater flows into the John Day River. No outflows were located along the John Day River north of the Meadowbrook apartment complex.

Stream 239, which is defined as the John Day River above Cottonwood Bridge, has an average flow rate of 202 cubic feet per second (cfs), and is therefore considered a moderate to large stream (USGS 2011).

The 15-mile TDL is presented in Figure A-5.

7.2.2 Targets

No drinking water intakes were identified along the 15-mile TDL.

Based on fish catch data published by the Oregon Department of Fish and Wildlife (ODFW), approximately 1,960 pounds of fish are caught by anglers annually in Stream 239. Fish catch data is displayed in Table B-7.

The John Day River contains the following federal threatened or endangered species for which critical habitat has been designated within the 15-mile TDL: bull trout (*Salvelinus confluentus*) (USFWS 2013a). Additional fish species which inhabit the John Day River include steelhead (*Oncorhynchus mykiss*), coho salmon (*Oncorhynchus kisutch*), and Chinook salmon (*Oncorhynchus tshawytscha*) (ODFW 2012).

Federally listed species, which may occur in Grant County, are listed below. The exact habitats of these species are unknown (Portland State University 2012, USFWS 2013a, USFWS 2013b).

- **Listed Species:** Bull trout (*Salvelinus confluentus*), steelhead (*Oncorhynchus mykiss*), gray wolf (*Canis lupus*), Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis).*
- **Designated Species:** None.
- **Proposed Species:** None.
- **Candidate Species:** Columbia spotted frog (*Rana luteiventris*), greater sage-grouse (*Centrocercus urophasianus*), yellow-billed cuckoo (*Coccyzus americanus*), North American wolverine (*Gulo gulo luscus*), whitebark pine (*Pinus albicaulis*).
- **Partial Status:** Fisher (*Martes pennanti*).
- **Species of Concern:** Malheur mottled sculpin (*Cottus bairdi ssp.*), Pacific lamprey (*Lampetra tridentata*), Westslope cutthroat trout (*Oncorhynchus clarki lewisi*), Great Basin redband trout (*Onchorhynchus mykiss gibbsi*), Blue Mountains cryptochian caddisfly (*Cryptochia neosa*), Lynn's clubtail dragonfly (*Gomphus lynnae*), California floater mussel (*Anodonta californiensis*), northern goshawk (*Accipiter gentilis),* upland sandpiper (*Bartramia longicauda*), ferruginous hawk (*Buteo regalis*), black tern (*Chlidonias niger*), olive-sided flycatcher (*Contopus cooperi*), willow flycatcher (*Empidonax traillii adastus*), yellow-breasted chat (*Icteria virens*), Lewis's woodpecker (*Melanerpes lewis),* mountain

quail (*Oreortyx pictus)*, white-headed woodpecker (*Picoides albolarvatus*), Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), northern sagebrush lizard (*Sceloporus graciosus graciosus*), pallid bat (*Antrozous pallidus*), pygmy rabbit (*Brachylagus idahoensis*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), silver-haired bat (*Lasionycteris noctivagans*), western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), yuma myotis (*Myotis yumanensis*), Preble's shrew (*Sorex preblei*), Henderson ricegrass (*Achnatherum hendersonii*), Henderson's bentgrass (*Agrostis hendersonii*), upward-lobed moonwort (*Botrychium ascendens*), crenulate grape fern (*Botrychium crenulatum*), mountain grape fern (*Botrychium montanum*), twin-spike moonwort (*Botrychium paradoxum*), stalked moonwort (*Botrychium pedunculosum*), Peck's mariposa lily (*Calochortus longebarbatus var. peckii*), dwarf evening-primrose (*Camissonia pygmaea*), Idaho sedge (*Carex idahoa*), Colonial luina (*Luina serpentina*), disappearing monkeyflower (*Mimulus evanescens*), least phacelia (*Phacelia minutissima*), arrow-leaf thelypody (*Thelypodium eucosmum*), Howell's thelypody (*Thelypodium howellii ssp. Howellii*).

The 15-Mile TDL has approximately 5.25 miles of wetlands frontage (see Table B-8 and Figure A-5 for the extent of the wetlands considered along the 15-mile TDL) (USFWS 2012).

7.2.3 Sediment Samples

7.2.3.1 Sediment Sample Locations

Six sediment samples were collected along the John Day River, including one field duplicate and one background sample (TechLaw 2012i). Four samples and one duplicate sample were collected on the south bank of the John Day River approximately 200 to 400 feet north of the site. The background sample was collected from the south bank of the John Day River approximately 0.25 miles east and upgradient of the site.

The off-site pathway sediment sample locations are presented in Figure A-3.

7.2.3.2 Sediment Sample Results

Arsenic was detected at elevated concentrations in three sediment samples (including the duplicate sample) collected from John Day River, northwest of the site. The elevated arsenic concentrations were all below the 5.9 mg/kg TEL. Although no other TAL metals were detected at elevated concentrations, chromium and nickel were detected at concentrations exceeding the TELs in all six sediment samples collected (NOAA 2008). None of the other detected (but not elevated) concentrations exceed the TELs. In addition, hexavalent chromium was not detected in any of the sediment samples collected.

Analytical results for the sediment samples are presented in Table B-3.

7.3 Soil Exposure Pathway

The soil exposure pathway is evaluated based on the threat to residents, workers, and nearby populations from soil contaminants within the first two feet of the surface (EPA 1990).

The Tri-County Concentrating Mill facility is located in the City of John Day, Oregon. The property is accessible via Highway 26- John Day Highway on Main Street. The site is not fenced, is primarily residential, and is accessible to the public.

7.3.1 Targets

The Missouri Census Data Center (MCDC) states there are 1,113 residents within one mile of the Site (MCDC 2010). Table B-6, located in Appendix B, provides a breakdown of the nearby population.

The site is currently occupied with two multi-family residential apartment complexes and one business. The complexes contain a total of 43 units, and the current number of residents on-site is 76 (TechLaw 2012f). Two workers are present on site at the apartment complexes, and the OSP Outpost has one off-site employee, which is the OSP Officer assigned to that region. The assigned Master Sergeant (MSgt) patrols the region in the police cruiser for a majority of his shift, and is not a fulltime employee in the OSP Outpost (TechLaw 2012c). A river shelter, located on the John Day River approximately 80 feet north of the apartment complex is occasionally used by a local church group for picnics and socials. There are five schools and two daycare centers located within 0- to 2- miles of the site, the closest daycare or school is 686 feet southwest of the site on Highway 26 / Main Street (MapQuest 2013).

No other activities or occupations such as commercial or agricultural, occur on the site. There are no terrestrial sensitive environments documented on-site.

7.3.2 Surface Soil Sampling

Eight surface soil samples, including one background and one duplicate, were collected as part of this SI. The surface soil sampling locations and results are discussed in Sections 6.1.1 and 6.1.2, respectively.

7.4 Air Migration Pathway

The air migration pathway is evaluated based on the potential threat to on-site and nearby populations within a 4-mile radius of Tri-County Concentrating Mill. No air samples were collected during the sampling activities and the air migration pathway was not evaluated as part of this SI.

8.0 SUMMARY AND CONCLUSIONS

In November 2012, START-3 conducted an SI at the Tri-County Concentrating Mill facility in John Day, Grant County, Oregon. Between 1951 and 1958 a milling and concentrating facility conducted operations at the site until the government chromite subsidy program ended. The Cobalt Gold Mines, Inc. operated until the late 1950s but exact dates of operation are unknown. Over time, the property boundaries changed and ownership history up to construction of current structures in the 1980s is unclear. According to a Meadowbrook Apartment complex employee, it is estimated that approximately 10 to 15 feet of fill was brought in for construction purposes in approximately 1979. It is likely a majority of the former mill operations were covered by top fill. The current structures appear on aerial maps in 1983 and 1984, based on the 2011 ODEQ Site Assessment report. The structures currently located on the former mill property include the two Meadowbrook apartment complexes and the OSP Outpost office.

The SI objectives focused on the potential for migration of contaminants from the Tri-County Concentrating Mill property to surface water and nearby targets. The groundwater migration, surface water migration, and soil exposure pathways were evaluated for purposes of this SI. Eight surface soil samples, six groundwater samples, and six sediment samples were collected.

Sample locations are presented in Figure A-3.

8.1 Sources

Because the site is currently covered with buildings or impermeable surfaces, surface soil samples could not be collected directly from the areas associated with the former Tri-County Concentrating Mill operations. Further, the Meadowbrook Apartment Maintenance Superintendent stated 10 to 15 feet of fill was placed over the original site grade in 1979. Therefore, seven surface soil samples, including one duplicate, were collected slightly offsite from the northern property line. For purposes of this SI, the seven surface soil samples collected from the vicinity of the northern property line were used as source samples.

Cadmium and mercury were detected at elevated concentrations in three surface soil samples collected from the two eastern-most locations. In addition, zinc was detected at elevated concentrations in the two eastern-most surface soil samples, but not in the duplicate sample collected from one location. None of the elevated concentrations of cadmium, mercury, or zinc exceed the residential or industrial RSLs for soil. Arsenic concentrations in all seven surface soil samples collected were not elevated when compared to the background concentration, but exceed the residential and industrial RSLs. Five of the arsenic concentrations were slightly above the state average for naturally occurring arsenic. In addition, three of the concentrations detected in surface soil samples exceeded the residential RSL for cobalt; however, the concentrations were not elevated when compared background. No additional elevated concentrations were detected in surface soil samples collected. Surface soil sample results are discussed in Section 6.1 and are summarized in Table B-2.

8.2 Pathways

START-3 collected sediment and groundwater samples to determine if current and past activities at Tri-County Concentrating Mill have impacted the migration pathways. Five sediment samples and one background sediment sample were collected from along the John Day River to determine potential impact to the surface water migration pathway. A total of six off site groundwater samples were collected to evaluate contamination to the groundwater migration pathway.

Three TAL metal constituents, copper, lead, and manganese, were detected at elevated concentrations in groundwater samples. Copper, lead, and manganese were detected at elevated concentrations in City Well #3. Manganese was also detected at elevated concentrations in City Well #5 and the fairgrounds well. The elevated copper and lead concentrations detected in City Well #3 do not exceed the MCLs. The elevated concentrations of manganese detected in the groundwater samples (one field and one duplicate sample) collected from City Well #5 exceed the National Secondary Drinking Water Regulations. Groundwater sampling results are results are discussed in Section 7.1.3.2 and are summarized in Table B-4.

Arsenic was detected at elevated concentrations in three sediment samples (including the duplicate sample) collected from along the John Day River, northwest of the site. The elevated arsenic concentrations do not exceed TEL. Although no other TAL metals were detected at elevated concentrations, chromium and nickel were detected at concentrations exceeding the TELs in all six sediment samples collected. Sampling results are results are discussed in Section 7.2.3.2 and are summarized in Table B-3.

8.3 Targets

The groundwater migration pathway TDL includes a 4-mile radius that extends from the Tri-County Concentrating Mill property. Groundwater within four miles of the former Tri-County Concentrating Mill site supplies community and domestic wells and is used for irrigation. Based on information obtained from the City of John Day Public Works Director, 95 percent of the drinking water for the residents within the City of John Day is supplied by the community water system, which consists of four deep water wells and Long Gulch Spring. The exact locations of domestic wells located within the TDL are unknown; however, based on information obtained from the City of John Day Public Works Director, domestic wells in the area are not typically used for drinking water (TechLaw 2012d, TechLaw 2012h)

No drinking water intakes were identified along the 15-mile TDL.

Based on fish catch data published by the ODFW, approximately 1,960 pounds of fish are caught by anglers annually in Stream 239, which is defined as the John Day River above Cottonwood Bridge. Fish catch data is displayed in Table B-7. There are several listed and candidate species habituating in Grant County; however, exact locations and their proximity to Tri-County Concentrating Mill are unknown. A portion of the John Day River within the 15-mile TDL has been identified as a critical habitat for the federally endangered bull trout. There are 5.25 miles of wetlands frontage along the 15-mile TDL.

Approximately 1,113 persons reside within a 1-mile radius of Tri-County Concentrating Mill. There are five schools and two daycare centers located within 0- to 2- miles of the site, the closest daycare or school is 686 feet southwest of the site on Highway 26 / Main Street (MapQuest 2013). Tri-County Concentrating Mill is a currently the site of two apartment building complexes and an OSP Outpost. There are two on-site employees at Meadowbrook Apartments and one off-site employee at the OSP. The property is accessible via Highway 26 / John Day Highway / Main Street. The site is not fenced and is accessible to the public.

8.4 Conclusions

Based on the analytical data gathered during the SI and an assessment of the targets associated with all pathways at the Tri-County Concentrating Mill facility, the groundwater, surface water migration, and soil exposure pathways are of minimal concern.

Because the majority of the site is now paved or covered by buildings, surface soil samples could not be collected from potentially contaminated soil associated with previous mill operations. In addition, 10 to 15 feet of fill material was reportedly placed over the site in 1979, eliminating the threat of exposure to the first two feet of surface soil. Observed releases of contaminants (cadmium, mercury, and zinc) were documented in surface soil samples collected from two locations within 200 feet of the apartment complex, along the northern bank leading to the John Day River. None of the concentrations exceed the RSLs. Although arsenic and cobalt were not detected at elevated concentrations with respect to background concentrations, several surface soil samples contained concentrations that exceed the RSLs. However, due to the current site conditions, the likelihood of nearby residents coming into contact with potentially contaminated soil is limited, as the contamination associated with mill operations is well below 2 feet bgs. In addition, although site-related contamination is present in the surface soil along the northern bank, the probability of nearby residents gardening or children playing along the steep bank is unlikely. Therefore, the soil exposure pathway is of minimal concern.

Copper, lead and manganese were detected at elevated concentrations in groundwater samples collected; however, none of these constituents were detected at elevated concentrations in source samples. In addition, the concentrations of copper and lead are below the MCLs. Manganese concentrations exceed the national secondary drinking water regulations value in two of the wells sampled. Based on the limited number of persons (1,505 persons) supplied with drinking water from sources within the 4-mile TDL, the groundwater migration pathway is of minimal concern.

Arsenic was detected at elevated concentrations in two sediment samples collected along the John Day River; however, arsenic was not detected at elevated concentrations in source samples. The elevated concentrations of arsenic are below the TEL. Based on the lack of observed release to the surface water pathway, the pathway is of minimal concern.

Groundwater and surface water pathway samples collected during this SI did not yield observed releases of contaminants detected in source samples (cadmium, mercury, and zinc). Hexavalent chromium was not detected in any of the surface soil, groundwater, or sediment samples collected.

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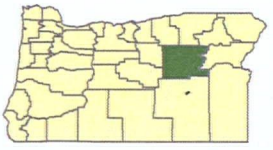
APPENDIX A
FIGURES

Source: USDA DRG County Mosaic by NRCS

Created by: TLB
Date: 1/17/2013

TechLaw
Quality & Integrity



Explanation of Symbols

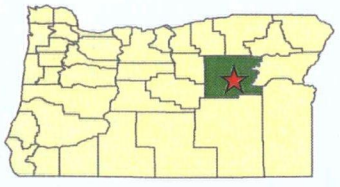
★ Site Location

Figure A-1
Site Location
Tri-County Concentrating Mill (Former)
Grant County
John Day, Oregon

Source: USGS DRG
Mosaic from USDA 2002
Grant County Assessor

Created by: TLB
Date: 1/17/2013

TechLaw
Quality & Integrity



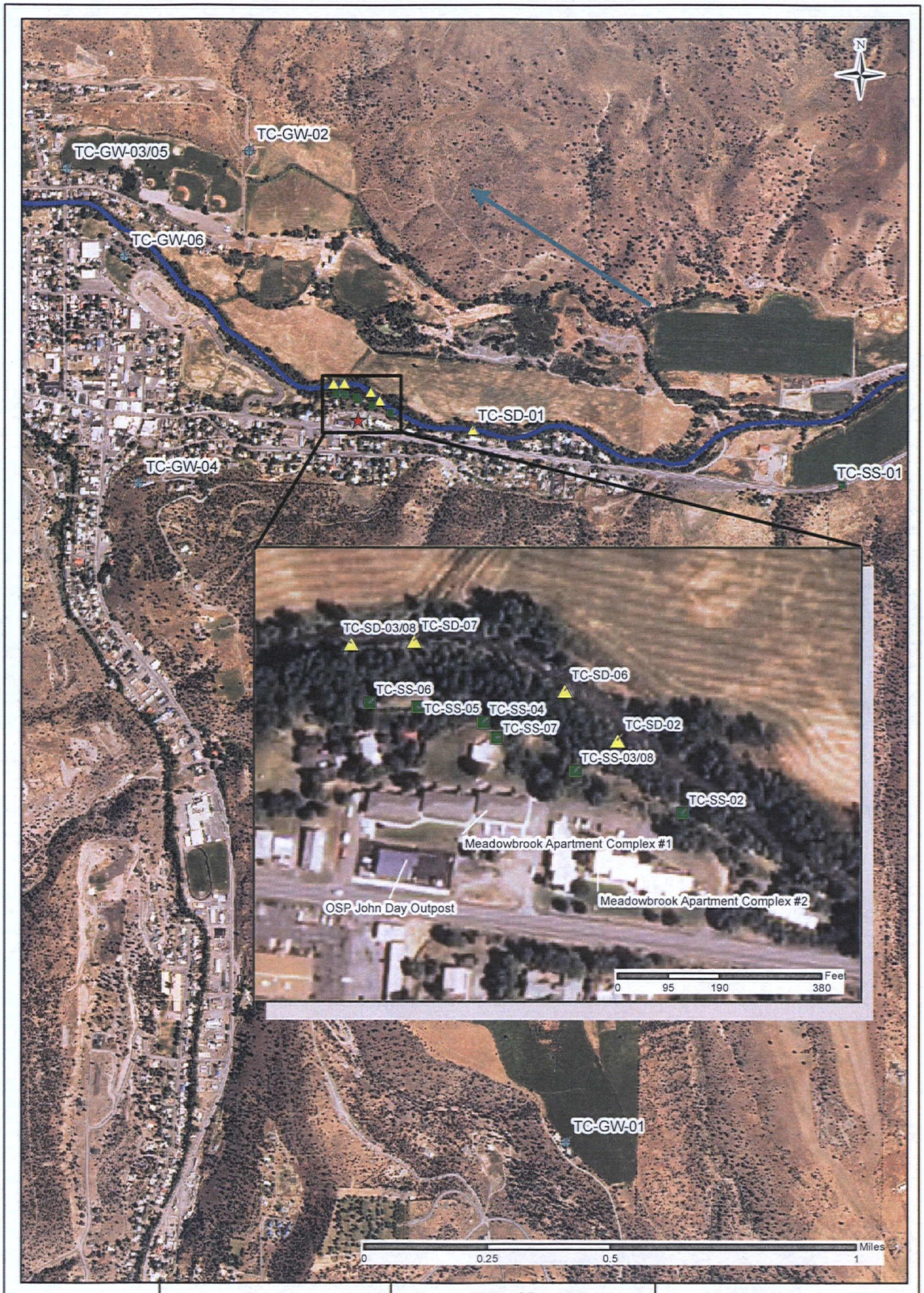
Explanation of Symbols

Tax Plots

Possible location of mill buildings

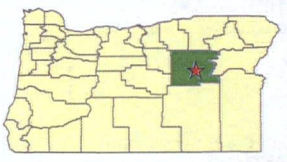
*Tax plot lines are approximate and are not to scale.

Figure A-2
Site Layout
Tri-County Concentrating Mill (Former)
Grant County
John Day, Oregon



Source: USGS DRG
Mosaic from USDA 2002
Grant County Assessor

Created by: TLB
Date: 12/19/2012



Explanation of Symbols

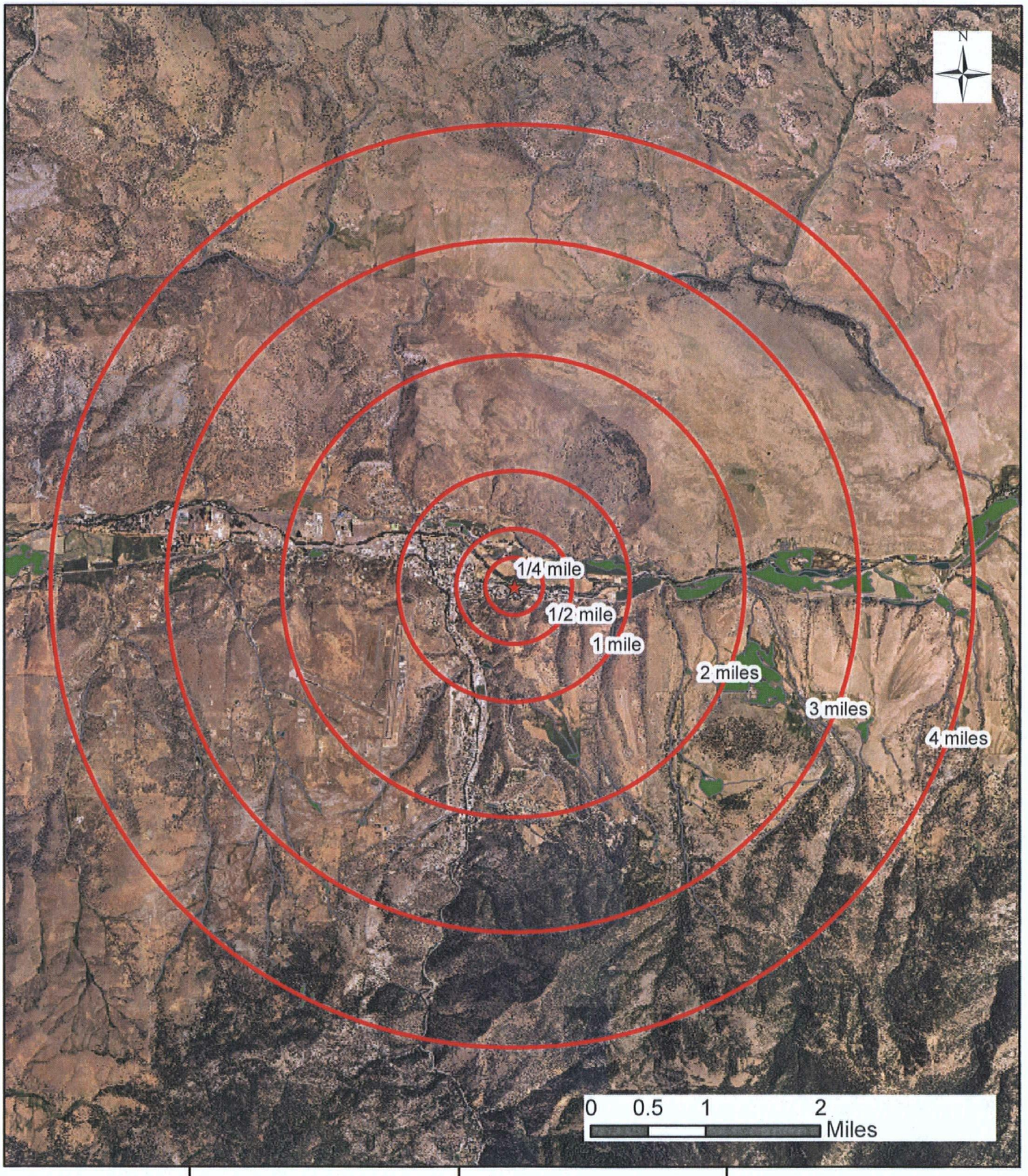
- Site Location
- Estimated Groundwater Flow Direction
- John Day River

Sample Type

- Groundwater
- Sediment
- Surface Soil

* TC = Tri-County

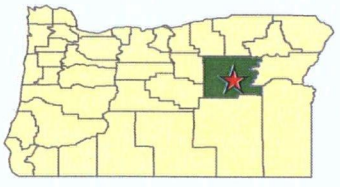
Figure A-3
Sample Locations
Tri-County Concentrating Mill (Former)
Grant County
John Day, Oregon



Source: USGS DRG
Mosaic from USDA 2002

Created by: TLB
Date: 1/17/2013

TechLaw
Quality & Integrity



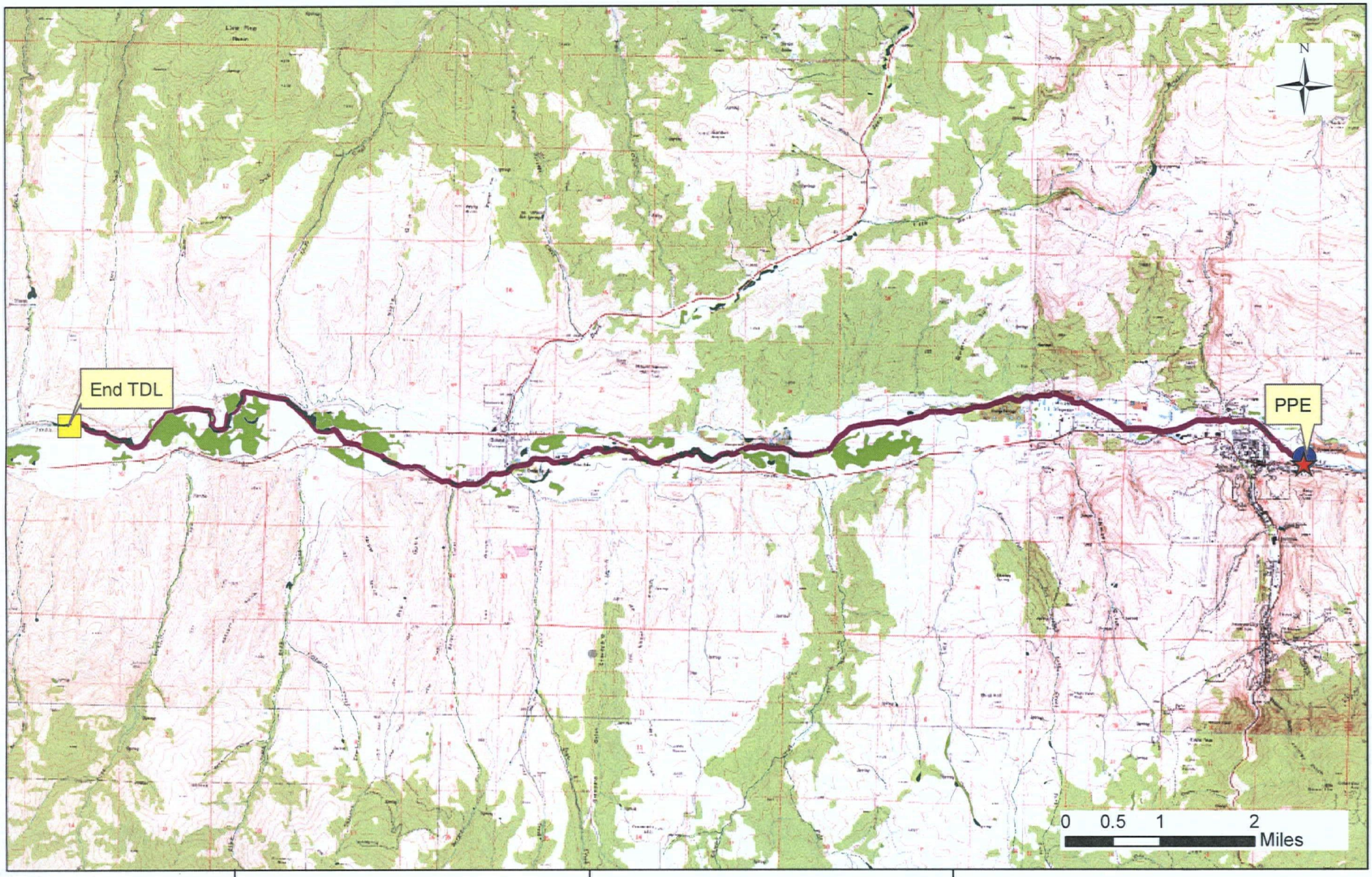
Explanation of Symbols

- Site Location
- Radial Rings

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

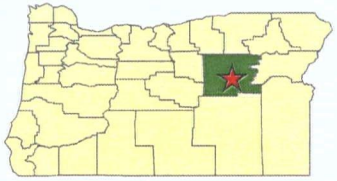
Figure A-4
4-mile Radius Map
Tri-County Concentrating Mill (Former)
Grant County
John Day, Oregon



Source: USDA DRG County Mosaic by NRCS

Created by: TLB
Date: 1/17/2013

TechLaw
Quality & Integrity



Explanation of Symbols

- End of TDL
- TDL
- Site Location
- PPE

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

Figure A-5
15-mile TDL
Tri-County Concentrating Mill (Former)
Grant County
John Day, Oregon

APPENDIX B
TABLES

Appendix B Key
Tri-County Concentrating Mill (Former)
John Day, Grant County, Oregon

Bold =	Concentration greater than SQL/CRQL
Bold and Underlined =	Concentration elevated when compared to background
µg/L =	Micrograms per liter
CLP =	Contract Laboratory Program
ft =	Feet
GW =	Groundwater
ID =	Identification
IS =	Industrial Soil
J =	The analyte was positively identified. The associated numerical result is an estimate.
K =	Unknown Bias
L =	Low Bias
Location ID =	START-3 sample identification number
MCL =	Maximum Contaminant Level
mg/kg =	Milligrams per kilogram
Q =	The result is estimated because the concentration is below the sample quantitation limit/Contract Required Quantitation Limit
R =	Rejected data
RS =	Residential Soil
RSL =	Regional Screening Level
SD =	Sediment
SQL =	Sample Quantitation Limit
SS =	Subsurface soil
TB =	Trip Blank
TC =	Tri-County Concentrating Mill
TEL=	Threshold Effect Level
U =	Analyte was not detected above the level of the associated value.

Table B-1
Sample Collection Summary
Tri-County Concentrating Mill (Former)
John Day, Grant County, Oregon

Location ID	CLP Sample ID	Matrix	Description
TC-GW-01	MJSJZ5	Water	Background; off-site, approximately 1.5 miles south of Tri-County Concentrating Mill
TC-GW-02	MJSJZ6	Water	Off-site, City Well #3, approximately 0.6 miles north of Tri-County Concentrating Mill
TC-GW-03	MJSJZ7	Water	Off-site, City Well #5, approximately 0.7 miles north northwest of Tri-County Concentrating Mill
TC-GW-04	MJSJZ8	Water	Off-site, Long Gulch Springs Well, approximately 1.0 miles south of Tri-County Concentrating Mill
TC-GW-05	MJSJZ9	Water	Off-site, duplicate of TC-GW-03
TC-GW-06	MJSK01	Water	Off-site, Grant County Fairgrounds, approximately 0.5 miles northwest of Tri-County Concentrating Mill
TC-SD-01	MJSJY7	Sediment	Background; off-site, upgradient on the John Day River approximately 0.25 miles east of Tri-County Concentrating Mill
TC-SD-02	MJSJY8	Sediment	Off-site; PPE of John Day approximately 400 feet north east of Meadowbrook Apartment Complex #1 Manager's Office.
TC-SD-03	MJSJY9	Sediment	Off-site; PPE of John Day approximately 220 feet northwest of Meadowbrook Apartment Complex #1 Manager's Office.
TC-SD-06	MJSJZ2	Sediment	Off-site; PPE of John Day approximately 300 feet northeast of Meadowbrook Apartment Complex #1 Manager's Office.
TC-SD-07	MJSJZ3	Sediment	Off-site; PPE of John Day approximately 200 feet north of Meadowbrook Apartment Complex #1 Manager's Office.
TC-SD-08	MJSJZ4	Sediment	Duplicate of TC-SD-03
TC-SS-01	MJSJZ4	Soil	Background, off-site, approximately 1.0 mile east of Tri-County Concentrating Mill
TC-SS-02	MJSJX9	Soil	Off-site; approximately 107 feet north of the northeast corner of Meadowbrook Apartment Complex #2
TC-SS-03	MJSJY0	Soil	Off-site; approximately 139 feet north of the northwest corner of Meadowbrook Apartment Complex #2
TC-SS-04	MJSJY1	Soil	Off-site; approximately 40 feet northwest of Meadowbrook Apartment Complex #1 Manager's Office deck
TC-SS-05	MJSJY2	Soil	Off-site; approximately 181 feet north northeast of the northwest corner of Meadowbrook Apartment Complex #1 on the south edge of the City of John Day easement access road
TC-SS-06	MJSJY3	Soil	Off-site; approximately 153 feet north of the northwest corner of Meadowbrook Apartment Complex #1 on the south edge of the City of John Day easement access road
TC-SS-07	MJSJY4	Soil	Off-site; approximately 20 feet north of Meadowbrook Apartment Complex #1 Manager's Office deck
TC-SS-08	MJSJY5	Soil	Off-site; Duplicate of TC-SS-03

Table B-2
Analytical Results Summary - Soil Samples
Tri-County Concentrating Mill
John Day, Grant County, Oregon

Analyte	CLP Sample ID		MJSJX9	MJSJY0	MJSJY1	MJSJY2	MJSJY3	MJSJY4	MJSJY5	MJSJY6
	Sample Date		11/13/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012
	Field Sample ID		TC-SS-01 (Background)	TC-SS-02	TC-SS-03	TC-SS-04	TC-SS-05	TC-SS-06	TC-SS-07	TC-SS-08 (Duplicate of TC-SS-03)
	Human Health Screening Criteria									
	EPA RSL - RS[1] (mg/kg)	EPA RSL - IS[2] (mg/kg)								
Inorganic Compounds (mg/kg)										
Arsenic	0.39	1.6	**2.3**	**5.2**	**6.2**	**4.0**	**2.7**	**3.9**	**3.7**	**5.5**
Barium	15000	190000	**192**	**222**	**244**	**212**	**202**	**153**	**206**	**219**
Beryllium	160	2000	0.31 JQ (SQL 0.63)	0.64 U	0.56 U	0.32 JQ	0.67 U	0.63 U	0.61 U	0.54 U
Cadmium	70	800	0.27 JQ (SQL 0.63)	**0.89**	**0.76**	0.33 JQ	0.38 JQ	0.36 JQ	0.35 JQ	**0.83**
Chromium	120000	1500000	**48.6** JL	**35.8** JL	**37.5** JL	**62.7** JL	**48.4** JL	**73.4** JL	**65.3** JL	**38.8** JL
Cobalt	23	300	**17.4**	**23.6**	**17.7**	**26.3**	**22.3**	**20.9**	**27.0**	**16.7**
Copper	3100	41000	**22.9** JL	**57.3** JL	**49.8** JL	**38.0** JL	**36.9** JL	**37.0** JL	**39.2** JL	**48.9** JL
Lead	400	800	**6.3**	**11.2**	**9.8**	**4.6**	**8.3**	**6.7**	**5.4**	**9.3**
Manganese	1800	23000	**566** JL	**544** JL	**395** JL	**705** JL	**707** JL	**499** JL	**774** JL	**316** JL
Mercury	23	310	0.12 U	**0.26**	**0.15**	0.12 U	0.13 U	0.13 U	0.12 U	**0.18**
Nickel	1500	20000	**78.5**	**38.9**	**51.2**	**115**	**80.9**	**109**	**109**	**46.6**
Selenium	390	5100	4.4 U	1.7 JQ	1.7 JQ	4.3 U	4.7 U	4.4 U	4.3 U	1.5 JQ
Vanadium	390	5200	**39.0**	**68.8**	**61.3**	**85.1**	**67.3**	**75.8**	**93.7**	**60.2**
Zinc	23000	310000	**37.0**	**154**	**112**	**53.8**	**65.1**	**55.4**	**62.5**	**106**

1. EPA Regional Screening Levels for Residential Soil, dated November 2012
2. EPA Regional Screening Levels for Industrial Soil, dated November 2012

Table B-3
Analytical Results Summary - Sediment Samples
Tri-County Concentrating Mill
John Day, Grant County, Oregon

Analyte	CLP Sample ID	MJSJY7	MJSJY8	MJSJY9	MJSJZ2	MJSJZ3	MJSJZ4
	Sample Date	11/13/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012
	Field Sample ID	TC-SD-01 (Background)	TC-SD-02	TC-SD-03	TC-SD-06	TC-SD-07	TC-SD-08 (Duplicate of TC-SD-03)
	Human Health Screening Criteria						
	Freshwater Sediment TEL[1] (mg/kg)						
Inorganic Compounds (mg/kg)							
Arsenic	5.9	1.3 JQ (SQL 1.65)	**1.3**	**2.5**	1.4 JQ	**3.3**	**2.5**
Barium	--	**110** JK	**99.0** JK	**121** JK	**145** JK	**153** JK	**127** JK
Cadmium	0.596	0.80 U	0.63 U	0.26 JQ	0.24 JQ	0.27 JQ	0.24 JQ
Chromium	37.3	**85.9** JL	**69.4** JL	**128** JL	**106** JL	**118** JL	**100** JL
Cobalt	--	**13.8**	**12.5**	**22.0**	**16.4**	**18.6**	**19.1**
Copper	35.7	**15.9**	**13.8**	**18.9**	**20.4**	**28.2**	**20.4**
Lead	35	**4.3**	**3.0**	**2.7**	**5.0**	**1.4**	**2.7**
Manganese	--	**299** JL	**278** JL	**382** JL	**293** JL	**543** JL	**307** JL
Nickel	18	**146**	**115**	**299**	**189**	**188**	**189**
Vanadium	--	**43.7**	**41.5**	**50.1**	**51.0**	**72.6**	**46.7**
Zinc	123	**33.3**	**30.4**	**34.8**	**41.8**	**31.9**	**33.4**

1. National Oceanic and Atmospheric Administration Threshold Effect Level for freshwater sediment

-- = No screening criteria are published in the Regulatory Documents for this analyte

Table B-4
Analytical Results Summary - Groundwater Samples
Tri-County Concentrating Mill
John Day, Grant County, Oregon

Analyte	CLP Sample ID		MJSJZ5	MJSJZ6	MJSJZ7	MJSJZ8	MJSJZ9	MJSK01
	Sample Date		11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012
	Field Sample ID		TC-GW-01	TC-GW-02	TC-GW-03	TC-GW-04	TC-GW-05	TC-GW-06
	Well Depth (ft)		278-370	250	199	370	199	50
	Description		Background Upgradient Well on Private Property	City Well #3	City Well #5	Long Gulch Springs Well	Duplicate of TC-GW-03	Fairgrounds Well at Campsite #21
	Human Health Screening Criteria							
	EPA RSLs for Tapwater (µg/L)[1]	EPA Drinking Water MCLs[2](µg/L)						
Inorganic Compounds (µg/L)								
Arsenic	0.045	10	**3.9**	0.94 JQ	**1.3**	**2.2**	**1.2**	**1.8**
Barium	2900	2000	**57.0**	**47.4**	**34.0**	**38.7**	**32.9**	**34.4**
Chromium	0.031*	100	**7.1**	2.0 U	2.0 U	**8.4**	2.0 U	**5.1**
Copper	620	1300	1.2 JQ (SQL 2)	**63.8**	1.0 JQ	2.0 U	2.0 U	1.6 JQ
Lead	--	15	0.93 JQ (SQL 1)	**5.4**	1.0 U	1.0 U	1.0 U	1.0 U
Manganese	320	50**	1.0 U	**26.1**	**108**	1.0 U	**106**	**14.7**
Nickel	300	--	0.48 JQ (SQL 1)	0.27 JQ	0.32 JQ	0.30 JQ	0.25 JQ	1.0 U
Vanadium	78	--	**8.6**	5.0 U	5.0 U	**6.8**	5.0 U	3.8 JQ
Zinc	4700	--	**215**	**21.8**	**7.3**	0.56 JQ	**5.5**	**14.4**

1. EPA Regional Screening Levels for Tapwater, dated November 2012

2. EPA Maximum Contaminant Level for drinking water

-- = No screening criteria are published in the Regulatory Documents for this analyte

* RSL for hexavalent chromium

** National Secondary Drinking Water Regulations value; EPA Maximum Contaminant Level not listed

Table B-5

Groundwater Drinking Water Population within a 4-Mile Radius

Tri-County Concentrating Mill

John Day, Grant County, Oregon

Distance Ring (miles)	Number of Wells	Well Population (Domestic and Community)
On Site	0	0
0 to 1/4 mile	Domestic: 1 Partial Community System: 0	16 306
1/4 to 1/2 mile	Domestic: 3 Partial Community System[1]: 1	22 423
1/2 - 1 mile	Domestic: 12 Partial Community System: 0	17 329
1 - 2 mile	Domestic: 48 Irrigation: 2 Industrial: 1 Partial Community System[2]: 1	67 1,279
2 - 3 mile	Domestic: 108 Irrigation: 4 Industrial: 1 Partial Community System: 0	13 244
3 - 4 mile	Domestic: 192 Irrigation: 6 Industrial: 2 Partial Community System: 0	136 2,580
Totals	**Domestic: 363** **Irrigation: 12** **Industrial: 4** **Partial Community Systems: 2**	**271** **5,161**

Oregon Water Resources Department, Well Log Query Application, http://apps.wrd.state.or.us/apps/gw/well_log/

[1] The City of John Day Community system consists of one spring and two wells and served a total of 1,920 people in 2008. According to the City of John Day Public Works Director, 95% of the population is served by Community System water (TechLaw 2012d, TechLaw 2012h). 95% of the population in each radial ring (Missouri Census Data Center, Circular Area Profiles (CAPS) http://mcdc.missouri.edu/websas/caps10c.html) was calculated as the well population for community wells. http://170.104.63.9/countyinventory.php

[2] The Town of Canyon City community system consists of two springs and one well and served a total of 676 people in 2008. According to the City of John Day Public Works Director, 95% of the population is served by Community System water (TechLaw 2012d, TechLaw 2012h). 95% of the population in each radial ring (Missouri Census Data Center, Circular Area Profiles (CAPS) http://mcdc.missouri.edu/websas/caps10c.html) was calculated as the well population for community wells. http://170.104.63.9/countyinventory.php

Table B-6
Population within a 4-Mile Radius
Tri-County Concentrating Mill (Former)
John Day, Grant County, Oregon

Distance Ring (miles)	Population
0 to 1/4 mile (including 76 on-site)	322
1/4 to 1/2 mile	445
1/2 - 1 mile	346
1 - 2 mile	1,346
2 - 3 mile	257
3 - 4 mile	2,716
TOTAL	**5,432**

Sources: U.S. Census Bureau 2010

START-3 Reconnaissance of Tri-County Concentrating Mill

*Total population was estimated based upon combined information from the U.S. Census Bureau and known locations of wells from the OWRD well database.

Table B-7
Fisheries Catch Data
Oregon Department of Fish and Wildlife

Fishery Name[1]	Species	Number of Fish Caught	Catch Data[2] (pounds)
John Day River above Cottonwood Bridge[3] (Stream 239 Data) – 2010	Spring Chinook[5]	18	540
	Summer Steelhead[4]	71	1,420
	Total		**1,960**

Notes:
[1] Fish catch data is not presented for the small unnamed creek located north of John Day River, ODFW has closed streams to Salmon and Steelhead fishing. ODFW does not compile fish catch data for other species.[2] ODFW defines fish catch data as Sport Fishing Catch, it is not defined as catch for consumption. Fish weight was calculated based upon the average weight for each specific species multiplied by the actual number of fish caught. The fish are listed by species and run.
[3] The section of the John Day River that is located in John Day, Oregon is a small percentage of the several hundred miles of river defined by ODFW as Stream 239.
[4] The weight for steelhead ranges from 3 pounds to 55 pounds depending upon the source, 20 pounds was selected as an average weight.
[5] The weight for Chinook salmon ranges from 10 to 55 pounds depending, but can reach as high as 130 pounds, based upon the source, 30 pounds was selected as an average weight.
Table A-1 represents the most current fish catch data available online from the Oregon Department of Fish and Wildlife (ODFW 2010).

Sources:

Wikipedia 2012a - Coho Salmon. http://en.wikipedia.org/wiki/Coho_salmon. Accessed online March 7, 2012.
Wikipedia 2012b - Chinook Salmon. http://en.wikipedia.org/wiki/Chinook_salmon. Accessed online March7, 2012.

Table B-8
Wetlands Frontage Along 15-mile TDL
Tri-County Concentrating Mill
John Day, Grant County, Oregon

Water Body and Linear Distance of TDL along Water Body	Linear Wetlands Frontage Miles (feet)
John Day River (15 miles)	5.25 miles (27,696.71 feet)

Source:
USFWS 2009

APPENDIX C
PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH #01

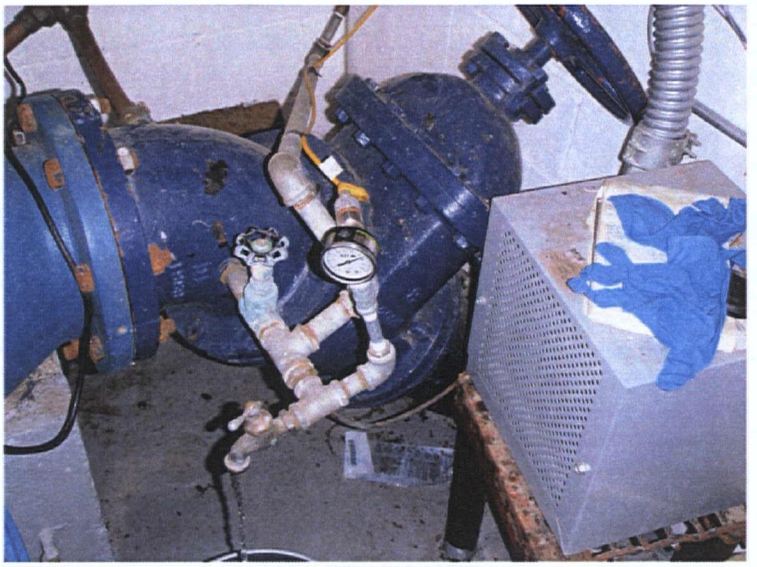
Description: Sample location of TC-GW-04 near Long Gulch Springs.

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	South
Witness:	Dave Holland, John Day PWD.	Date:	November 13, 2012

PHOTOGRAPH #02

Description: Reservoir #2 on left and reservoir #1 on right. Sample location was between the reservoirs, but the sample water had not yet been stored in either reservoir.

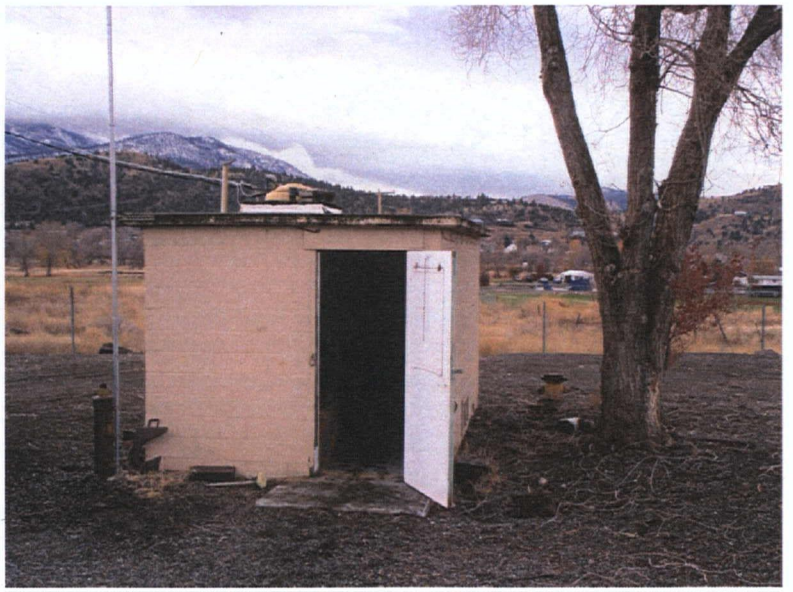
Taken by:	Bryan Berna, TechLaw Inc.	Direction:	South
Witness:	Dave Holland, John Day PWD	Date:	November 13, 2012



PHOTOGRAPH #03

Description: TC-GW-02 sample point.

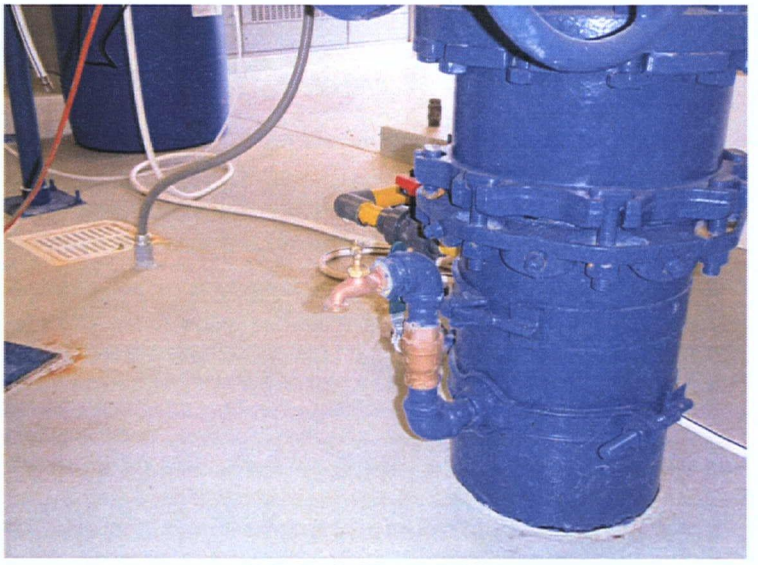
Taken by: Bryan Berna, TechLaw Inc.
Witness: Dave Holland, John Day PWD.
Direction: N/A
Date: November 13, 2012



PHOTOGRAPH #04

Description: Well house #3.

Taken by: Bryan Berna, TechLaw Inc.
Witness: Dave Holland, John Day PWD
Direction: South
Date: November 13, 2012



PHOTOGRAPH #05

Description: Sample spigot for TC-GW-05.

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	N/A
Witness:	Dave Holland, John Day PWD.	Date:	November 13, 2012

PHOTOGRAPH #06

Description: Well house #5.

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	South
Witness:	Dave Holland, John Day PWD	Date:	November 13, 2012

PHOTOGRAPH #07

Description: Well and spigot for TC-GW-01 (background).

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	Northeast
Witness:	Amanda Rohrbaugh, TechLaw Inc.	Date:	November 13, 2012

PHOTOGRAPH #08

Description: TC-GW-06 standpipe spigot sample point at campsite #21.

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	Southwest
Witness:	Laura Wilson, TechLaw Inc.	Date:	November 13, 2012

PHOTOGRAPH #09

Description: Fairgrounds campsite #21. Location of TC-GW-06.

Taken by:	Bryan Berna, TechLaw Inc.	Direction:	Southeast
Witness:	Laura Wilson, TechLaw Inc.	Date:	November 13, 2012

PHOTOGRAPH #10

Description: Location of background sample TC-SD-01.

Taken by:	Amanda Rohrbaugh, TechLaw Inc.	Direction:	East
Witness:	Laura Wilson, TechLaw Inc.	Date:	November 13, 2012

PHOTOGRAPH #11

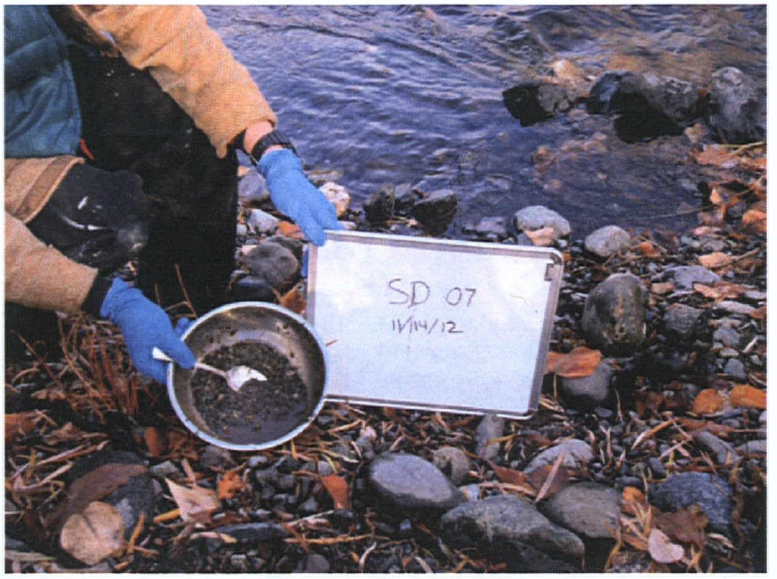
Description: Background Soil sample, collected on the south side of Highway 25 approximately one mile east of the site.

Taken by:	Amanda Rohrbaugh, TechLaw Inc.	Direction:	South
Witness:	Laura Wilson, TechLaw Inc.	Date:	November 13, 2012

PHOTOGRAPH #13

Description: Location of samples TC-SD-03/TC-SD-08 (field duplicate).

Taken by:	Ken Marcy, EPA	Direction:	North
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012



PHOTOGRAPH #14

Description: Location of sample TC-SD-07.

Taken by:	Ken Marcy, EPA	Direction:	North
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #15

Description: Location of sample TC-SD-06.

Taken by:	Ken Marcy, EPA	Direction:	North
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #16

Description: Location of sample TC-SD-02.

Taken by:	Ken Marcy, EPA	Direction:	North
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #17

Description: Location of sample TC-SS-07.

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #18

Description: Location of sample TC-SS-04.

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #19

Description: Location of sample TC-SS-02.

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #20

Description: Location of samples TC-SS-03 and TC-SS-08 (field duplicate).

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #21

Description: Location of sample TC-SS-05.

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

PHOTOGRAPH #22

Description: Location of sample TC-SS-06.

Taken by:	Laura Wilson, TechLaw Inc.	Direction:	South
Witness:	Bryan Berna, TechLaw Inc.	Date:	November 14, 2012

APPENDIX D
GPS SAMPLE LOCATION DATA

Table D-1
Sample Locations
Global Positioning System Coordinates
Tri-County Concentrating Mill (Former)
John Day, Grant County, Oregon

Location ID	CLP Sample ID	GPS Coordinates
TC-GW-01	MJSJZ5	44.39484262, -118.933078545
TC-GW-02	MJSJZ6	44.423921672, -118.94709187
TC-GW-03	MJSJZ7	44.423268749, -118.954525541
TC-GW-04	MJSJZ8	44.414026933, -118.951283035
TC-GW-05	MJSJZ9	44.423268749, -118.954525541
TC-GW-06	MJSK01	44.420707331, -118.952094264
TC-SD-01	MJSJY7	44.415835267, -118.937640611
TC-SD-02	MJSJY8	44.416627573, -118.941481264
TC-SD-03	MJSJY9	44.417091702, -118.94339522
TC-SD-06	MJSJZ2	44.416875937, -118.941866675
TC-SD-07	MJSJZ3	44.417112509, -118.942947227
TC-SD-08	MJSJZ4	Duplicate of TC-SD-03
TC-SS-01	MJSJZ4	44.414467423, -118.922407049
TC-SS-02	MJSJX9	44.416262689, -118.941004549
TC-SS-03	MJSJY0	44.416465637, -118.94177635
TC-SS-04	MJSJY1	44.416702325, -118.942443929
TC-SS-05	MJSJY2	44.416774023, -118.94290869
TC-SS-06	MJSJY3	44.416789544, -118.943249902
TC-SS-07	MJSJY4	44.41662655, -118.942346304
TC-SS-08	MJSJY5	Duplicate of TC-SS-03

Key:

CLP Sample ID =	Contract Laboratory Program sample identification number
GPS =	Global positioning system
GW =	Groundwater
Location ID =	START-3 sample identification number
TC =	Tri-County Concentrating Mill (Former)
SD =	Sediment
SS =	Surface Soil

APPENDIX E
FIELD LOGBOOK

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www.RiteintheRain.com

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Logbook #1 of 2

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Tri County
Concentrating
Mill
November 13 2012 -

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Project Site Investigation Sampling

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CONTENTS

PAGE	REFERENCE	DATE

Tech Law Personnel
Bryan Berna
Jaina Wilson
Amanda Rohrbaugh

EPA
Ken Marcy

Capt. ID #'s
Horriba – 512036
Trimble – 5B6188
Trimble – A60806
Cameras – XE 118
XE 117
XE 120

Tri County 11/13/12

0700 meet at hotel to Discuss work plan for day. B. Berna will go with Public Works director to collect city well samples from wells # 3 & 5 & from Long Gulch Springs. Team will meet at city hall to contact Public Works Director Dave Holland.

B. Berna will go with D. Holland & L. Wilson & A. Rohrbaugh will contact apt. Manager and OSP Sgt. Jansen at site

0806 L. Wilson arrives at City Hall to meet Dave Holland. Team needs to sample city wells #3 and #5 as well as long gulch springs. He calls an employee to come down to City Hall and escort Techlaw field team to the wells. D. Holland says there are some old chrom mines up on the hillside, but they have not been worked in about 100 years. He says they sample city wells for metals,

Tri county 11/13/2012

including total chromium, but the Techlaw team will be sampling for hexavalent chromium. D. Holland says the only water source they sample that contains chromium is the long gulch spring.

0816 Two employees of the city arrive at City Hall building to escort the field team to the wells, Matty and Casey.

0821 B. Berna goes with Casey to begin sampling process while L. Wilson and A. Rohrbaugh head to store to obtain ice and other field supplies.

0843 arrive at Meadowbrook Apartments to meet with apartment manager, Becky, to discuss where we can collect samples from. There is a discussion about what we are looking for and why we are sampling. Becky is concerned about whether the soil is dangerous, so L. Wilson reassures her about the situation (the lack of exposure due to paved and covered areas).

0920 L. Wilson and A. Rohrbaugh walk along

Tri County 11/13/2012

the perimeter of the apartment complex and adjacent police office for potential soil sample locations. Locations will be finalized once EPA OSC Ken Marcy arrives on site.

0942 L. Wilson is making calls to residents identified as potential groundwater sample locations (they have wells on their property) in order to determine where additional samples will be collected (samples other than city wells). The first call is to (b) (6) (b) (6) Ellison Ranch. There is a well upgradient of the Meadowbrook Apartments located on the Ellison Ranch. (b) (6) has given permission for the field team to collect a sample from the well.

0956 L. Wilson calls Mary Weaver at the fairgrounds (541) 575-1900 to discuss sampling the well located at the fairgrounds but there was no answer. A voice mail message was left.

1003 L. Wilson calls Jackson Oil Company at (541) 575-0804, and the manager confirms the casing was pulled and the well

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abandoned.

1015 L. Wilson and A. Rohrbaugh leave to head to (b) (6) Ellison's (b) (6)

1029 arrive at (b) (6) and L. Wilson speaks with her about where the well is located. The well and an adjacent spigot are located along a fence to the NE of the (b) (6)

1031 B. Berna calls to get directions to the Ellison Ranch. He will meet up with us to help collect the sample from her well.

1044 B. Berna arrives at the ranch.

1046 (b) (6) provides her mailing address because she would like to receive a copy of the results of her well sample (GW-01, background). see below. ☆

1058 B. Berna collects GW-01. The other sample info (such as water quality parameters) are in log book 2 of 2.

☆ mailing address (b) (6)

note that the well is their water source

Rita in the Rain

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~~the~~ for drinking water.

1059 Marny Weaver calls L. Wilson to tell her that yes the field team can collect a sample from the fairgrounds well.

1108 the field team departs from the Ellison Ranch: B. Berna heads to the fairgrounds while L. Wilson and A. Rohrbaugh head to the home of a (b) (6) who owns a piece of property adjacent to the NW portion of the Meadowbrook Apartments.

1118 arrive at the courthouse on the corner of Canyon City Blvd and Izee Rd to speak with (b) (6) The field team would like to gain permission to collect a soil sample from his property. (b) (6) says he does not want anyone to sample on his property. He does not believe there are any issues with his soil and does not want to participate. He mentions that he might be interested in it only if something is found at the apartment complex.

1135 L. Wilson and A. Rohrbaugh depart the courthouse and head to the fairgrounds.

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1147 L. Wilson and A. Rohrbaugh arrive at the fairgrounds. There is an RV park along the north part of the fairgrounds. Each camp site has a spigot. The fairgrounds well provides water to each camp site spigot as well as the fairgrounds office building. The water is used for drinking. B. Berna has set up to collect a water sample from the spigot at camp site #21. There are a total of 25 RV camp sites. The groundskeeper is away and Marny Weaver does not know the location of the well, so L. Wilson left her contact info to have the groundskeeper pass on any info about the well when he returns.

1208 field team departs from the fairgrounds.

1348 arrive at SUZ E Ques store, which backs up to the river. Field team is hoping to get access to the river via the store property. The owner, Joe, gives us permission to go back to the river via his business property, located at 777 E. Main, John Day, OR.

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1408 A. Rohrbaugh collects GPS coordinates at SD-01 (background location) and takes photo #10 facing east, of the sample location.

1410 L. Wilson collects SD-01, which is dark brown in color, saturated with water and very full of organic mater (roots).

1450 AR drive up Hwy 22 E to find a soil background location.

1455 L. Wilson collects SS-01 and A. Rohrbaugh collects GPS coordinates. A. Rohrbaugh takes photo #11 of SS-01 facing east. Soil is dark brown, silty, some clay, some organic matter present (field grass). This location is a background soil location located a few miles east of the Meadowbrook Apartments

1510 L. Wilson and A. Rohrbaugh return to the apartment complex and EPA OSC Ken Marcy meets field team there. L. Wilson and K. Marcy are going to select and mark locations for soil/sediment samples on site. A. Rohrbaugh is entering information into Scribe database program.

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1643 L. Wilson and K. Marcy return from marking sample locations and the field team leaves the site.

11/13/2012

Rain in the Rain

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0719 field team and EPA OSC K. Marcy arrive at the Meadowbrook Apartments. Team B Berna and J. Wilson gear up to move to sample areas A. Rohrbaugh entering Scribe Data.

J. Wilson arrives at SS-02 in the northeast section of MB Apts at the Bottom of the slope near the River.

0742 Camera XE118 Photo #1 facing S of soil sample SS-02. JW

0745 collect soil using earth Baud to homogenize soil SS-02 is MS/MSD.

GPS unit SBG188 not turning on, will use other GPS unit to collect pts when B. Berna has completed sediment Sampling

0750 completed sample at MS/MSD move to SS-03 location * note SS02 Sample soil is Brown with some vegetation and very few Rocks or pebbles. 11/14/12

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The consistency is silty & contains clay.

0805 collect Sample SS-03 & SS08 Duplicate. Sample location is North Downslope from the NE corner of MB Apts #2 Approx. 80 ft north of the fence-line and "Slow Children" sign. Soil is Brown (medium Brown), silty and contains small pebbles. Soil Sample taken approx. 4-6" below grass roots layer.

0806 Duplicate Sample SS08

0830 ARRIVE SS-04 located on steep Hillside Approx. 50 ft. Downslope from NW corner of Apt. managers deck. Soil is Silty, Clayey medium Brown w/ large angular Rocks. the area also contains garbage & debris (fence posts plastic cups, cigarette packs). sample at 0830.

0837 ARRIVE Sample location SS-05 located in easement area North of parcel 100 a NE corner 11/14/12

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at the Bottom of the slope. It appears to be an easement for a sewer line large cistern type features are located along an access road for the easement. Sample SS05 located approx 40 ft SW of sewer cistern. SS05 collected at 0842. Soil is dark Brown with some rocks (ranging from pebbles to large angular rocks) and is silty/clayey.

Sample SS-06 located Approx 150-200' west of SS-05 Soil dk brown silty/clayey with some small rocks. Sample time 0850

0905 ARRIVE last sample location SS 07 located Approx. 15 ft. down-slope from the NE corner of the Asst. Managers ~~Bldg~~ Office Bldg. deck. Soil is silty/sandy - light med Brown/grey. with some small rocks and pebbles. Sample time 0907

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0920 spoke to Ned Coleman maintenance Super-intendent. Ned stated that all storm water drains to standpipe Cleanouts located along alley easement Ned also stated he'd fished along Approx. 35 miles of John Day River from ~~Prairie~~ Prairie City to Kimberly, and has not seen any standpipes or outflows into River except per those behind fairgrounds and ODFW Fish overflows.

Ned also grew up in John Day and remembers the meadowbrook Apt land as being 8-10 ft lower than the current elevation and that in Approx 1979 (to the best of his memory) the Backfill was brought in & filled up to 8-15 feet.

Ned also explained that in Approx 1995-1996 a backhoe was brought in to help repair some sewer issues a new const

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for new sewer features the area where the bank was removed + used as borrow material & for shaping. and the area from which soil samples were collected ~~was~~ from this more exposed soil more likely to have been native (~~not~~ fill from old mill possibly) Left Apartments mgrs. bldg. and relayed information to Ken Marcy @ 0950. B Berna & J Wilson return to Sampling area for sink to GPS + white board soil sample locations.
- leave log book w/ Amanda to Enter Scribe data etc. approx 0955.

11/14/12

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CONTENTS

PAGE Calibration Check DATE

Horiba
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EPA # 897671

11/13/12

	pH	NTU	mS/cm
INS	4.15 ✓	0.0	4.78 ✓
CAL	4.0	0.0	4.49

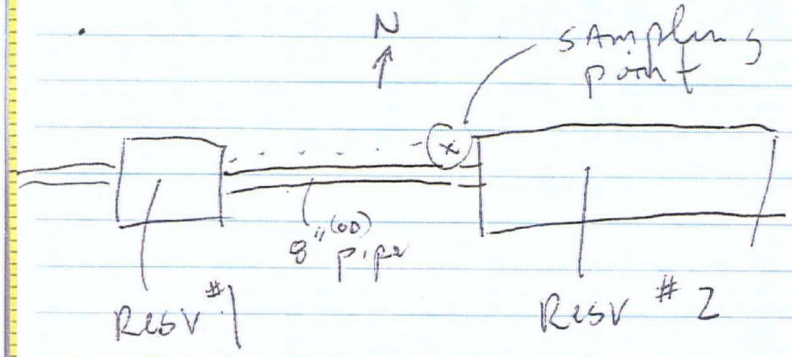
Dave Hyland Pb Works
Direction John (# 3,5)
Longhill Spring

GW-2 = MSMSD
(SS SD) = 2 poly

GW-3 = duplicate
(SS)(8) - 5

GW-1 = Background
SS, SD

Tri County
Lowe outlet springs 11/13



↓ location w/ Kasey.

water collected from 6" (ID) pipe prior to entry in to Resv. #

82-88 g/min from ~1 mile distance water runs through piping entire distance.
water is ~~coco~~ collected from inside weeping mine shaft.

PURGE begin 08:30

Tri County origin 11/13

piping is below surface at entrance of mine. The mine has been reenforced w/ concrete to prevent cave in.

Water Quality Measures

	#1	#2	#3	#4
pH	8.16	8.48	8.49	8.49
COND (mS/cm)	.415	.415	.416	.415
TURB (N)	∅	∅	∅	∅
DO (mg/L)	8.18	8.15	8.11	8.30
Temp (c)	14.3°	14.4	14.4	14.4
time	08:42	08:45	08:47	08:48

stability achieved

GW-04 collected by B. Berna @ 08:51 WATER DOES not have ~~discoloring~~ discoloring characteristics.

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GPS — Long Gulch GW

photos

	Facing	Descpt
# 100-0001	South	sample location of GW-04 water quality parameters collected
# 100-0002	South	Resv # 2 (left) Resv # 1 (right) sample location between, but prior to reaching either resv.

Well #3 sample collected from check valve w/ distribution ~~sample~~ line (BS) closed. Water is pre-treat / RAW. Well is naturally pressurized or artesian, 850 gal/min when running. (Not running). Has not run for 3 weeks. #5 primary

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Water Parameters

	#1	#2	#3
pH	8.16	8.17	8.18 (BS)
cond	.422	.427	.426
Turb	2	1	1
DO	1.65	1.85	1.29
Temp	12.3	12.3	12.3
Time	0930	0933	9:37

GW-2 collected by B. Berry @ 09:42 from well # 3.

GPS — Well-3

Photo —

100-0003	Down	GW-02 sampling point
100-0004	South	well house # 3

Rita in the Rain

Tri County 11/13

Well #5 primary winter well w/ current flow of 600 g/min. Pre treatment water.

~~WATER~~ spigot ~~sampling~~ port WATER NEAR CAPACITY so Flow kept to minimum.

H_2O Parameters

	#1	#2	#3
pH	8.11	8.14	8.18
Cond.	.458	.465	.480
Turb.	0	0	0
DO	6.14	4.60	5.64
Temp	14.1	13.9	13.8
Time	10:09	10:12	10:15

~~Beyon~~ 11/13/13

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GW-03 collected by B. Berna @ 10:16.

GW-05 collected by B Berna @ 10:17.

photo 005 DOWN sample spigot

" 006 SOUTH well house #5

1044 B. Berna arrives at Ellison Ranch, to meet rest of field team.

1047 begin to run water from spigot adjacent to the well, NE of the house

water quality parameters:

pH 8.44

conductivity .652

turbidity 0.0

DO 7.49

temp 12°C

1048 photo #7 facing NE taken by B. Berna of the well and spigot.

1054 water quality parameters:

pH 8.55

conductivity .655

turbidity 0.0

DO 6.6

temp 11.8

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1057 water quality parameters.

pH 8.56
conductivity .055
turbidity 0.0
DO 6.41
temp 11.6

1058 GW-01 Collected by B. Berna
WATER is consumed by well owner.

FAIRGROUNDS @ 11:31 11/13/12
GWATER Being drunk by RV campers & OFFICE STAFF.

Spigot collection @ composite #21 (of 25).

	#1	#2	#3
pH	8.29	8.33	8.36
COND	.445	.443	.441
Turb	158	158	158
DO	8.94	8.93	8.93
TEMP	12.7	12.8	12.8
Time	11:47	11:50	11:53

PM

Tri County 11/13/12

GW-06 collected by B. BERNA @ 11:54

(1540)

HACH DR/2400 s/N A40678
Method 8023
POWDER PILLOW

Sample #	RESULT		TIME
GW-01	0.00	mg/L Cr^{6+}	1546
STD #1 500 mg/L (STANDARD prepared 11-01-12 by T. PEARSON)	0.46	mg/L	1557
DUP GW-01	-0.01	mg/L	16:03
GW-02	-0.01	mg/L	16:11
GW-03	-0.01	"	16:20
GW-04	-0.00	"	16:27
GW-05	-0.01	"	16:37
STD #2 (500 mg/L)	0.46	"	16:37
GW-06	0.00	mg/L	1646

11/13/12 Rain in the Rain

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0720 onsite w/ Ken to collect remaining soil & sediment, RINSATE sample.

07:28 RB-01 collected by B. BERNA from bowl w/ table

07:52 SD 3, SD 08 07:53 collected by bryan BERNA on, south shore of river soils root layer rocks w/ silt JACK BROWN

photo number 100-1304
FACING NORTH KEN MARCY

0841 SD-07 collected by Bryan BERNA. soils gravely w/ some fines.

photo # 100-1305
FACING NORTH KEN MARCY

TRI COUNTY 11/14

0855 SAMPLE SD 06 collected by B. BERNA on south side of river. Soil silty w/ root material.

photo # 100-1306
FACING N. KEN MARCY

0920 sample SD-02 (MS/MSD) collected by B. BERNA soil is silty w/ root organics

photo 100-1307
FACING N KEN MARCY.

10:00 sediment sample collection complete. Returning to hotel to process samples.

11:50 sample processing complete. De mobing back to Boise.

11/14/12

Rite in the Rain

APPENDIX F
SAMPLE PLAN ALTERATION FORM

Sample Plan Alteration Form

Project Name and TDD Number: Tri-County Concentrating Mill (Former), 12-09-0007.

Material to be Sampled: Sediment.

Measurement Parameter: TAL metals and hexavalent chromium.

Standard Procedure for Field Collection and Laboratory Analysis (cite reference): TechLaw SOP 07-03-02: Soil Sampling and Analysis Procedures – Surface/Near Surface Soil Sampling (TechLaw 2011).

Variation from Field or Analytical Procedure: Sediment samples TC-SD-04 and TC-SD-05 were not collected.

Reason for Change in Field Procedure or Analysis Variation: The volume of collectable sediment at the sampling locations was insufficient due to presence of rocks and other obstructions. The Site Assessment Manager determined that sufficient sediment samples had been collected and that these two were not needed.

Special Equipment, Materials, or Personnel Required: None.

Initiator's Name: _____ Date: 12/7/12

TL Project Manager: _____ Date: 12/7/12

TL QA Officer: _____ Date: 1/23/13

EPA Task Monitor: _____ Date: 2/6/13

EPA QA Officer: _____ Date: 2/7/13

APPENDIX G
DATA VALIDATION MEMORANDA AND LABORATORY DATA
(CD VERSION ONLY)